Design Basics

An introduction to rudimentary design ideas & sources

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INTRODUCTION

How to use this book

The purpose of this collection of notes is to introduce a selection of the ideas and theories about design, and landscape design in particular, suitable for the beginning landscape student. This apparent mixed bag of notes provides a cheaper introduction to the fundamentals than having to purchase a dozen books! But please feel free to acquire those you can!

This little booklet is also a handy reference tool – a place to look for further information to be found in published texts, on the Internet, and so on. But if you want just one book that best sums things up, I would recommend Motloch:

Motloch, John L. (2001).
***Introduction to Landscape Design*, 2nd edition. New York: John Wiley & Sons.**

On the other hand, if you want to know more about the profession and the process of design overall, try this new text:

Waterman, Tim (2009).
***The Fundamentals of Landscape Architecture*. Lausanne, Switzerland: Ava Publishing SA.**

Who should use this "Design Basics" notebook?

This book is recommended particularly for students in these units:
DLB130 Landscape Design 1 and
DLB210 Landscape Design 2 and maybe
DLB310 Landscape 3

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Table of Contents:

What is Design?

"Good design is not a matter of wealth, much less of the chic, the latest thing. It is not a matter of novelty for the sake of novelty, but of the production of cities and houses and goods which will best satisfy the needs of the people; their need of practical, honest, cheap, lasting and beautiful things to use and see in their everyday life."

[Bertram 1938:19]

Bertram, Anthony (1938). *Design*. Harmondsworth, UK: Penguin Books.

WHO DESIGNS?

"All men [people] are designers. All that we do, almost all the time, is design, for design is basic to all human activity. The planning and patterning of any act towards a desired, foreseeable end constitutes the design process. Any attempt to separate design, to make it a thing-by-itself, works counter to the inherent value of design as the primary underlying matrix of life. Design is composing an epic poem, executing a mural, painting a masterpiece, writing a concerto. But design is also cleaning and reorganizing a desk drawer, pulling an impacted tooth, baking an apple pie, choosing sides for a back-lot baseball game, and educating a child.
Design is the conscious (and intuitive) effort to impose meaningful order."

[Papanek 1972 (and 2000):3]

ELEGANT DESIGN

"Designers often attempt to go beyond the primary functional requirements of *method, use, need, telesis, association*, and *aesthetics*; they strive for a more concise statement: precision, simplicity. In a statement so conceived, we find a degree of aesthetic satisfaction comparable to that found in the logarithmic spiral of a chambered nautilus, the ease of a seagull's flight, the strength of a gnarled tree trunk, the colour of a sunset. The particular satisfaction derived from the simplicity of a thing can be called elegance. When we speak of an elegant solution, we refer to something that reduces the complex to simple..."

[Papanek 2000:26]

RESPONSIBLE DESIGN

"Design, if it is to be ecologically responsible and socially responsive, must be revolutionary and radical in the truest sense. It must dedicate itself to nature's principle of least effort, in other words, maximum diversity with minimum inventory (to use Peter Pearce's good phrase) or doing the most with the least. That means consuming less, using things longer and being frugal about recycling materials."

[Papanek 2000:346]

Papanek, Victor (1972). *Design for the Real World: Making to Measure*. London: Thames & Hudson.

Papanek, Victor (2000). *Design for the Real World: Human Ecology and Social Change*. Revised 2nd edition. London: Thames & Hudson.

DESIGN #1

DESIGN TOOLS = Visual elements + design principles.

VISUAL ELEMENTS

→ *point, line, 2D shape, 3D form, colour/tone and texture*

DESIGN PRINCIPLES

→ *unity / variety, emphasis or focalisation, balance – symmetry and asymmetry, scale, proportion, contrast /tension, movement /rhythm, pattern*

Design Tools are also known as the *'Language of Art'*.

VISUAL ARTS as Ordering Mechanisms

There are many ways or systems of ordering shapes and forms that can be used by designers. Mathematical principles are common to most, even so-called chaotic things – be they objects found in nature or made by human beings. John L. Motloch considered three approaches to design ordering that are reflected in these chapters: Chapter 8 Visual Arts as Ordering Mechanism (2001:134-146); Chapter 9 Geometry as Ordering Mechanism (2001:147-157); and, Chapter 10 Circulation as Ordering Mechanism (2001:158-183). John O. Simonds (1997) wrote of similar matters, see: Chapter 11 Site Volumes, Chapter 12 Visible Landscape and Chapter 13 Circulation.

Exploring the Visual Elements

The designer can manipulate **Visual Elements** to meet client/user needs and to evoke certain moods.

POINT

The point is the most primary of elements. Conceptually, points have no length, width, depth or direction.
Points can imply intersection.

Points can generate lines, circles & spheres.

LINE

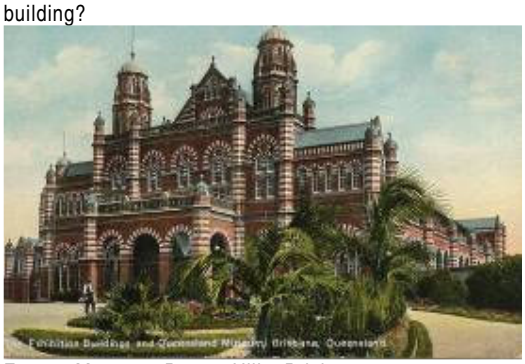
Lines have length & direction but no width or depth.
Line character (evokes certain human responses):

thick line	= strength
thin line	= delicacy
straight line	= stability
zigzag line	= energetic
curvy line	= sensuous, etc.

Lines imply planes and planes imply space.
There are also outlines and contour lines.

→ See more in section DESIGN #3.

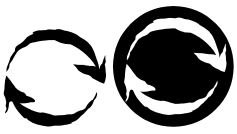
How are the elements of point, line and direction used in this building?



Former Museum, Bowen Hills, Brisbane

2 DIMENSIONAL SHAPE

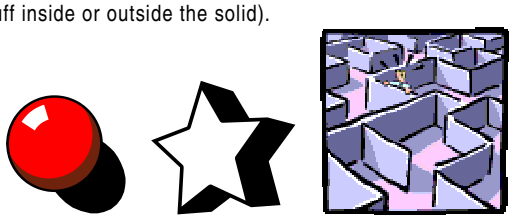
Shape is an area or surface configuration. ▲ ● ■



Shape = figure, Field = ground.
Thus: figure-ground relationship (aka. positive & negative space).

3 DIMENSIONAL FORM

Form is the essential structure or organisation of all parts in a work.
3D MASS is the SOLID entity while 3D SPACE is VOID (the stuff inside or outside the solid).



COLOUR/TONE

COLOUR is a property of light not objects.

HUE	= colour (wavelength)
VALUE	= relative lightness & darkness
INTENSITY	= brightness
TONE	= light/shade or all (hue/value/intensity).

WARM colours = reds/yellows
COOL colours = blues/greens

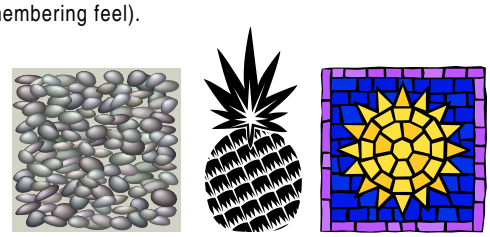
Mixing colours create more colours…
Primary Colours: red, yellow, blue

Secondary colours:	red+yellow	=orange
	red+blue	=violet
	yellow+blue	=green
Tertiary Colours:	yellow+green	=chartreuse
	yellow+orange	=gold
	red+orange	=scarlet
	red+violet	=purple
	blue+violet	=indigo
	blue+green	=turquoise

Colour evokes moods, has associations and meanings, communicates, affects microclimate, and can be part of passing fashions.

TEXTURE

Texture is about surface characteristics: smooth, rough, grained, corrugated, etc. There is tactile texture (felt by touch) and visual texture (the illusion of feel).
Visual texture unifies sight and touch (acting as triggers to remembering feel).

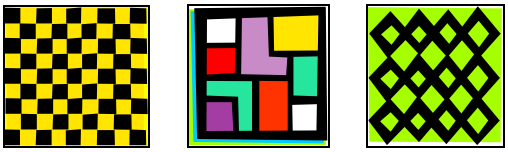


Exploring the Design Principles

Design Principles govern the manipulation of visual elements to certain effects; also, they influence the way we perceive compositions.

UNITY / VARIETY

UNITY or harmony implies elements in a composition belong together.
Unity = coherent, understandable design
Lack of unity = fragmented design
Unity is created by continuity or repetition or proximity of elements.

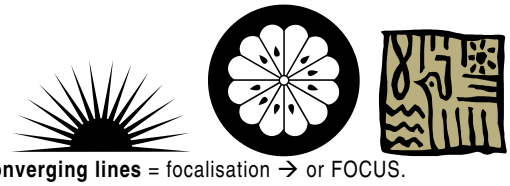


VARIETY provides interest.
There is a need to have unity within variety; theme within variation e.g. vernacular architecture
Conversely, there is a need for order with hint of spontaneity.

EMPHASIS / FOCALISATION

Focus **ATTENTION** to increase excitement!
Focal point (eyecatcher) = an element with a difference.

Eyecatcher | No focal point | tree + beach



Converging lines = focalisation → or FOCUS.
Use with restraint so as not to destroy overall unity **!**

BALANCE

Balance = visual resolution of forces. There are two kinds of balance: symmetry or asymmetry.

Symmetrical balance = aka. Formal balance:

= mirror images about an axis or axes.

Asymmetrical balance = aka. Informal balance:

= balance of dissimilar elements.

Informal balance is more dynamic!

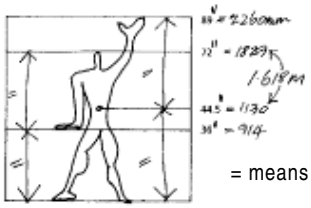
SCALE

Scale is concerned with interpreting **relative size** via some unit of measure especially a human being.

- intimate human scale (maximum about 16 x 6m)
- human scale (about 24 x 10m)
- public human scale (about 250m wide)
- superhuman (monumental)
- extra-human, vast non-human scale of nature (desert, sea, sky, etc.)

PROPORTION

Proportion is concerned with the RELATIVE dimensions of elements (length to width to depth). The search for a 'perfect' proportion is ongoing. Since the times of Ancient Greece, the 'Golden Mean' or 'Golden Section has been thought by some as the perfect proportion.
Golden Section = 1 : 1.618034... [etc.] or phi ∅
aka. 1: (1+√5)÷2 or about **3:5**
Often found in NATURE, e.g. ram's horn, nautilus shell, etc.
The Golden Mean can also be found in the mathematical **Fibonacci series** = 1,2,3,5,8,13,21,34,55,89,144...etc. and in Le Corbusier's 'Modular' Man proportion (see below).



= means equal.

ISO paper series comes close (at **1: 1.414 or √ 2**) but not exactly the same.

See more in section DESIGN #3.

CONTRAST / TENSION

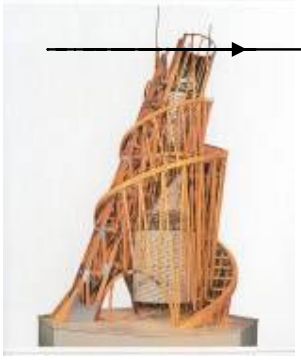
Tension = contrast or the opposition of various forms to produce a feeling of energy and vitality.

- too much tension is not pleasant!
- too little contrast can be boring...

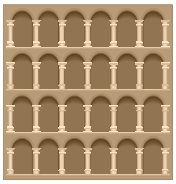
QUT (QIT) in 1971: Blocks A, B, C. Close up of C Block. Note the repetition and the variety of elements.

MOVEMENT / RHYTHM

This concerns the **illusion** of movement across a visual composition. There are various types of movement or rhythm (as in music...):
Legato = smooth; staccato = agitated; etc.



Source of image: model of V.Tatlin's "Monument to the Third International" in *The Art Book* 1996:453 (London: Phaidon)



Note arch rhythm, like a bouncing ball.

PATTERN

Generally, repetition of motifs = pattern. This is achieved by the use of lines, shapes, textures and colours.
Here are three ways to classify patterns: (not the only possible ways, mind you...):

- Dimensional patterns (using Euclidian geometry) 2D, 3D & 4D
- Figure / Ground patterns
- Tom Turner's classification of patterns into 4 types: Primary, Secondary, Tertiary & Quaternary !

See more in section DESIGN #7.

(1) Dimensional patterns

2 DIMENSIONAL = **shapes,** for example...

rectilinear ■ □ ◆ ❖
triangular ▲ ▶ ▼ ◀ ◊ △
circular ● ○ ◎ ⊙
freeform
combinations ◙ ⌘ ☺

3 DIMENSIONAL = **volumes,** for example...

cuboid / prismatic

pyramidal / prismatic

spherical / tubular / drum

freeform

combinations

4 DIMENSIONAL = **time & movement,** for example...

- **movement through space:**
  e.g. fast or slow, smooth or jerky, up/downwards...**changes & events over time**
  - solar patterns (day & night)
  - lunar patterns (over month)
  - seasonal patterns (over year)
  - generational patterns etc.

CONCLUSIONS:

Putting these ideas (design tools) into practice.Designers (and artists) use the visual elements and basic design principles to create designs – along with many other factors influencing their work.

The language of art is used to explain these creations to others – orally or in written form. Critics and Historians also use these descriptors to interpret creations. Here are some examples...

REFERENCES

Motloch, John L. (2001). Chapter 8 "Visual Arts as Ordering Mechanism", in Introduction to Landscape Design, 2nd edition. New York: John Wiley & Sons.

Riddell, Bruce (1986). Art in the Making, Milton, Q: Jacaranda Press.

Simonds, John O. (1997). Chapter 12 "Visible Landscape", in Landscape Architecture, 3rd edition. New York: McGraw Hill.

DESIGN #2

Designers source ideas and understanding from many places; mathematics is one such place.

GEOMETRICAL Ordering Mechanisms

This essay is concerned with geometric approaches to order in design. Motloch (2001) described Euclidian geometry and the geometry found in nature. Investigations into geometry have very ancient roots in Western cultures, and include the work of early Egyptian and Greek scholars, and the latest 20th century ideas about Chaos Theory and fractals. In addition to these ordering mechanisms, the final section of this discussion outlines some interesting mathematical patterns found in Adam Spencer's Book of Numbers.

EUCLIDIAN GEOMETRY

Euclid was an ancient Greek mathematician who lived in Alexandria (Egypt) 3rd century BCE. Motloch (2001:147) describes the four types of Euclidian geometry as: rectilinear, angular, circular and composites of these. A designer utilizes these geometries singularly or in combination, along with the ordering mechanisms of the visual arts to create successful and interesting schemes. Different human cultures attach distinct emotional characteristics to these geometries. See if you agree with Motloch's descriptions of emotional associations to geometries.

RECTILINEAR GEOMETRY

Rectilinear 2D shapes and 3D forms have the right angle (90°) as the determining component. Squares and rectangles are flat and two-dimensional. Cubes and some prisms are the solid forms of these. Motloch (2001:147) describes 3 visual forces inherent in rectilinear geometry: horizontal lines, vertical lines and right angles.

ANGULAR GEOMETRY

Angular 2D shapes and 3D forms have a smaller (acute angles) or greater (obtuse angles) angles than the right angle (90°) as the determining component. Equilateral triangles are based on three 60° angles and three equal sides. Triangular prisms are the solid forms of this geometry. Motloch (2001:148) describes 3 forces in angular geometry: point, radiating lines and angles. He maintains that acute angles generate energy – intensifying and increasing the dynamic qualities – while obtuse angles "convey a controlled, subdued, or refined energy."

CIRCULAR GEOMETRY

Circular 2D shapes the perfect roundness of the circle and includes the 3D forms sphere, drum or cylinder. Motloch (2001:149-150) describes 4 inherent forces in the circle: the generative point, the arc, the radial forces, and right angle where radials meet arcs.

COMPOSITE GEOMETRIES

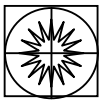
Rectilinear-Angular Composites:
e.g. superimposing circles create acute angles.

Rectilinear-Circular Composites:
e.g. tangents = 90° to the radius of circle or rounding off the corners!

Angular-Circular Composites:e.g. multi-pointed or radiating from centre of circle

stars

Rectilinear-Angular-Circular Composites:
e.g. combining the lot –
can be very fussy looking if not symmetrical!



GEOMETRY IN NATURE

The mathematical principles on which nature's patterns are based can be useful tools and insights for designers of all sorts. Designers are interested in both the structural patterns (frameworks, load-bearing systems, arrangements of parts) and the decorative aspects (colouration and patterning). However, we designers usually make use of the findings of the scientists who have provided the detailed understanding and measuring of these systems and patterns.

Biologist D'Arcy Thompson (1860-1948) first published his influential book On Growth and Form in 1917 and it still remains relevant today – although there have been enormous advances in understanding the workings of the natural world and the variety of species within it. While this work is naturally important to biologists, mathematicians and other scientists, it also intriguing to designers. With the growth of Modernism in the post-WW2 era, and efforts to remove 'style' from 'good design', the lessons that Nature offered seemed particularly tempting as a source of ideas. Many introductory texts for designers in 1960s and 1970s were full of references to organic forms and natural geometries. However, Nature's solutions to problems of structure and arrangement remain of interest in the 21st century for all sorts of reasons, including recent explorations regarding the use of metaphor and the fascination of Chaos and Gaia Theories.

The following brief discussion of natural patterns includes: branching systems, spirals, hexagonal systems and hydraulics. Without digging into the complex mathematics too much, the inspiration for designers is often in the visual arrangement, so illustrations have been incorporated here.

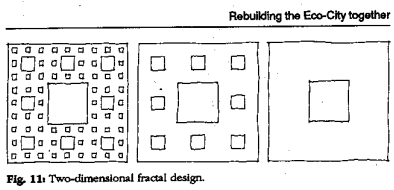
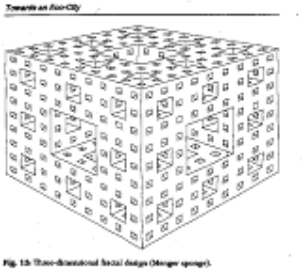


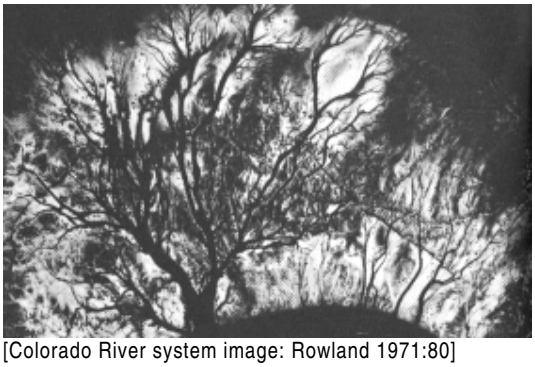
Fig. 11: Two-dimensional fractal design.



Images: Engwicht, David (1992). Towards an Eco-City. Sydney: Envirobook, pp, 123-124.

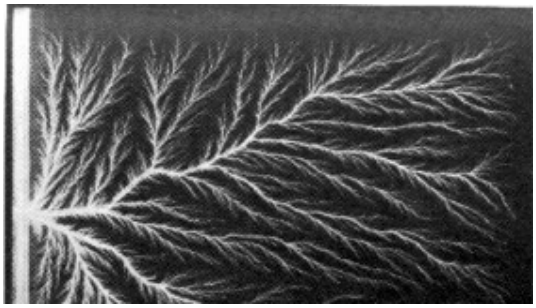
BRANCHING SYSTEMS
= Bifurcating linear patterns!

- Trees and their leaves
- River systems (whole sets of catchments, from the tidal mouth to the smallest creek)
- Blood circulation in some animals, e.g. humans and other mammals
- Some forms of lightening or other electrical discharge.

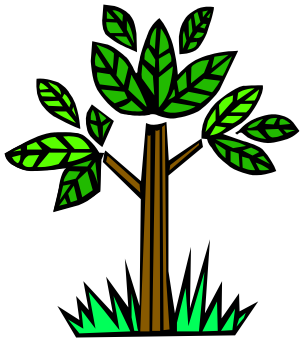


[Colorado River system image: Rowland 1971:80]

[Tree branches image: Rowland 1971:80]



[Electrical discharge image: Rowland 1971:81]



SPIRALS
(found in plants and animals and beyond)

Curvilinear patterns! True spirals have the same radius of curvature, such as the helix or the screw.

Equiangular spirals have a radius of curvature that increases (based on the Fibonacci number series) and are the most common form of spirals in nature. They include:

- Pinecones and pineapples
- Flower centres in the Compositae family (daisies).
- Shells (sea-shells –nautilus, cone, etc.)
- Horns of some goats, sheep, etc.
- Some microscopic creatures, e.g. Radiolarians
- Galaxies of stars!

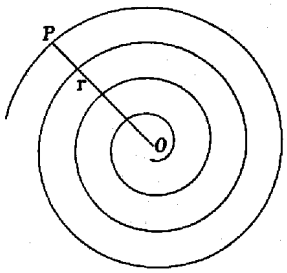


Fig. 72. The spiral of Archimedes.

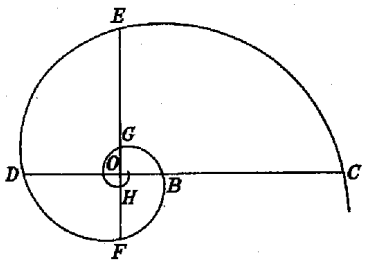


Fig 73. The equiangular spiral.

[Radius of curvature images: Thompson 1971:177]

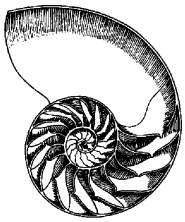


Fig. 70. The shell of *Nautilus pompilius*. From J. C. Chenu.

[Nautilus image: Thompson 1971:173]

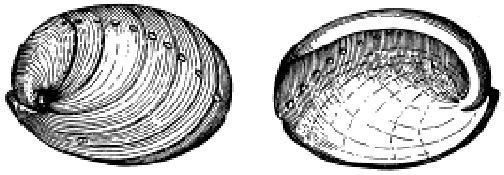


Fig. 84. A shell of *Haliotis*, showing the many lines of growth, or generating curves: the areas bounded by these lines of growth being in all cases gnomons to the pre-existing shell. From J. C. Chenu.

[Haliotis Image: Thompson 1971:186]

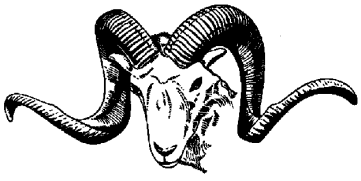


Fig. 94. Marco Polo's sheep: *Ovis poli*. From Cook.

[Sheep's horn image: Thompson 1971:209]

HEXAGONAL SYSTEMS

- Snowflakes (or water crystals) are based on the six-pointed star ★ that is comprised of 5 angles of 72° each (= 360°).
- Bee's honeycomb cells are based on a hexagonal prism – very strong and very compact.
- Some rocks form around hexagons – basaltic prisms, or some semi-precious gems

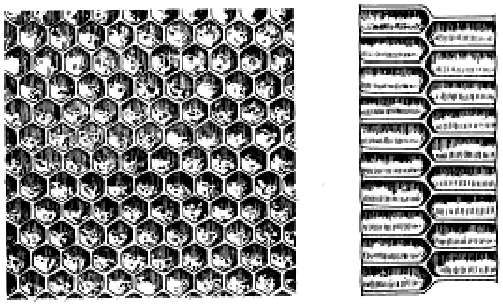


Fig. 42. Portion of a honeycomb. From T. Rayment, *A Cluster of Bees* (The Bulletin, Sydney).

[Bee cells image: Thompson 1971:109]

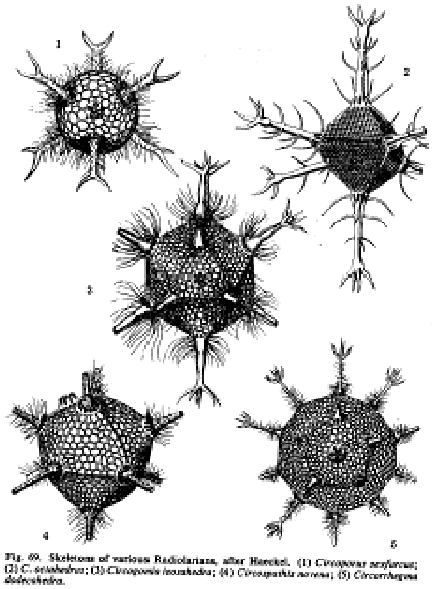


Fig. 69. Skeletons of various Radiolarians, after Haeckel. (1) *Circogonia icosahedra*; (2) *C. octahedra*; (3) *Circogonia icosahedra*; (4) *Circospathis sarcina*; (5) *Circorrhegma dodecahedra*.

[Radiolarians image: Thompson 1971:168]

Hydraulics

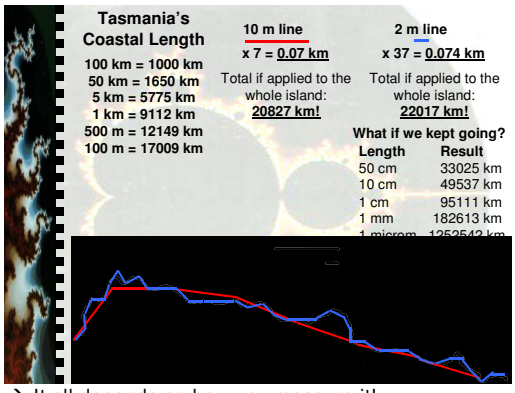
Liquids in action! Leonardo da Vinci was fascinated by the flow of water and drew sketches from observation. Slow-motion photography described the action of things that occur too fast for the human eye to perceive – and has been used by advertisers ever since! Fountain designers are the artists of water while hydraulic engineers and their scientific understanding of water, save our cities from floods and storm run-off damage.

- Flows: swirling, curling, surf, tides
- Drops and splats
- Bubbles and froth
- White noise or tabletop trickles and Feng Shui!

Chaos Theory & Fractal Geometry

This section was derived from GDLA student David Chick's excellent seminar (2000), "Order in Disorder" wherein he PROVED that Tasmania (his home State) is bigger than the Australian mainland! It got my attention too! Mind you his sister had just completed her PhD in pure mathematics on the topic of fractal geometry.

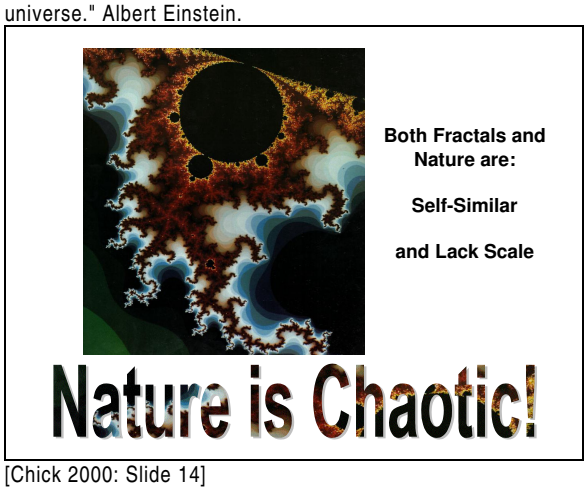
David wrote:
"This seminar will make you see everything differently! There is danger in listening further! You risk the loss of your childhood vision of clouds, forests, galaxies, leaves, feathers, flowers, rocks, mountains, torrents of water, carpets, bricks, and much else besides. Never again will your interpretation of these things be quite the same."
[Chick 2000:slide 3; Adapted from Bovill (1996:3)]



→ It all depends on how you measure it!
As proven on slides 7-10.

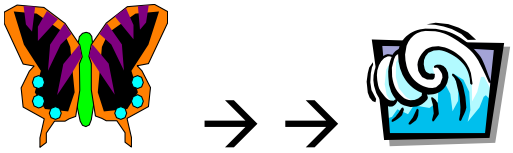
Natural Systems have a fractional dimension.
(slide 11)
"Why is [Euclidean] geometry often called cold and dry? One reason lies in its inability to describe the shape of a cloud, a mountain, a coastline, or a tree. Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line."Benoit Mandelbrot (Chick 2000: Slide 12).

WHAT IS FRACTAL GEOMETRY?
Slide 13: Fractal Geometry is the geometry which describes the chaotic systems we find in nature.
"Mathematics is the language with which God has written the universe." Albert Einstein.



[Chick 2000: Slide 14]

WHAT IS CHAOS [Theory]?
1. Chaotic systems are deterministic.
2. Chaotic systems are very sensitive to the initial conditions.



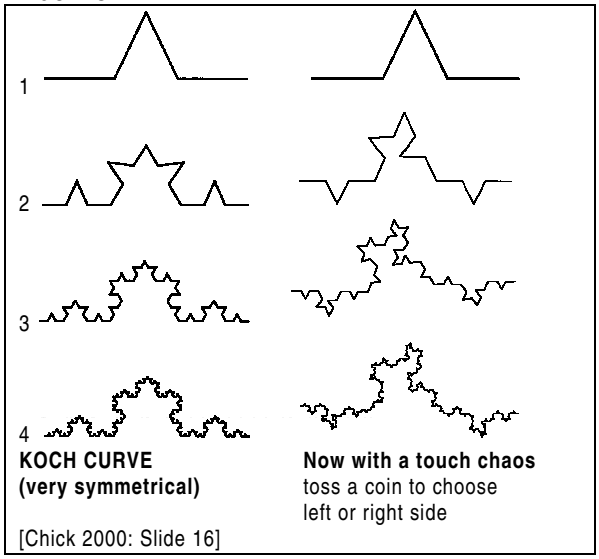
EXAMPLE: A butterfly flaps its wings in the Amazon... and there is a Tsunami in Japan.

CHAOS & FRACTALS FOR DESIGNERS:
FINALLY, David proposed there were several ways that landscape designers could make use of chaos theory and fractal geometry. He postulated 5 ways:

- a literal application → adding 'chaos to the standard Koch Curve (see below)
- using cues from nature → mimicking differing heights of shrubbery for freeway screen panels;
- using design cues from other fractals → e.g. music;
- concocting a theoretical application → pick-up-sticks tossed and resultant 'chaotic random' pattern followed); and,
- that "we are ALL butterflies" – we had just been visited and had been greatly influence by Sue Gifford from Common Ground (a UK community art + environment + heritage lobby group – see website www.commonground.org.uk).

[Chick 2000: Slides 16-20]

FIGURES:



KOCH CURVE
(very symmetrical)

Now with a touch chaos
toss a coin to choose
left or right side

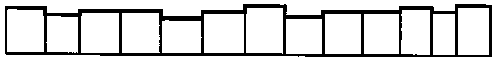
[Chick 2000: Slide 16]

Freeway Acoustic/Visual Screens
(1) random heights to screens → provides visual variety

[Chick 2000: Slide 17]

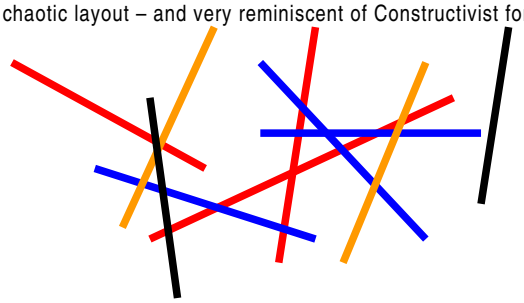
(2) Music notation provides pattern for visual variety in fence height.

becomes...



[Chick 2000: Slide 18]

CHAOTIC (RANDOM) LAYOUT:
"Pick-up sticks" or the leads for your propelling pencil... = a chaotic layout – and very reminiscent of Constructivist forms!



SOME OTHER MATHEMATICAL PATTERNS (Adam Spencer)

Triple J radio announcer and former PhD candidate in Mathematics, Adam Spencer penned a great little book that makes numbers interesting! I have extracted a few of the items I think are of interest for designers. They are mostly about constructing proportions and patterns.

FIBONACCI NUMBERS
Fibonacci aka. Leonardo of Pisa described a series of numbers in 1202, created by adding two numbers in a row to create the next one in the series, thus, 1, 1, 2, 3, 5, 8, 13, 21... etc. [Spencer 2000:8 & 21]
Nature has used this series many times in spirals, flower petals, etc. as described previously.

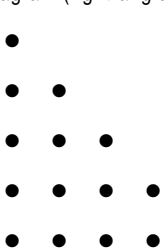
MAGIC SQUARES
Using the numbers 1 to 16 only once in one of the squares, each row in a magic square adds up to 34, e.g.

10	16	1	7	=34
?	?	?	?	=34
?	?	?	?	=34
15	5	12	2	=34
=34	=34	=34	=34	

[Spencer 2000:74]

TRIANGULAR NUMBERS

Triangular numbers form a series, which can be shown as a diagram (right-angled triangles), thus:



T_n = ½ x n(n+1)

In series: 1, 3, 6, 10, 15...

T_5 = ½ x 5(5+1)

= ½ x 5 x 6

= 15

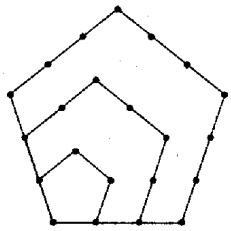
Diagram: 1+2+3+4+5=15

If you keep going adding all the numbers form 1 to 10... then... 1+2+3+4+5+6+7+8+9+10=55.

[Spencer 2000:36-37 & 123]

PENTAGONAL NUMBERS

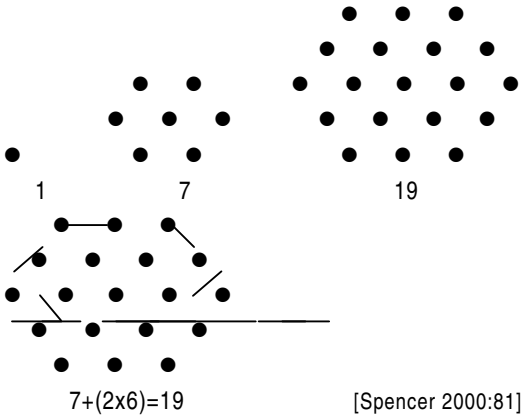
This series also can form a diagram, with pentagons that increase in size. Starting with the smallest pentagon of 5 points (where the five sides meet)... 5, 12, 22... etc.



[Spencer 2000:52]

CENTRED HEXAGONAL NUMBERS

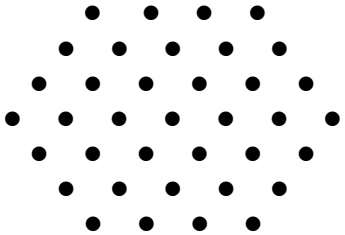
This series of numbers expands equilaterally in the diagram. Starting with one point, add 6 points around it, then another outer layer of 12 points, thus the series begins... 1, 7, 19, 37, 61...



1 7 19

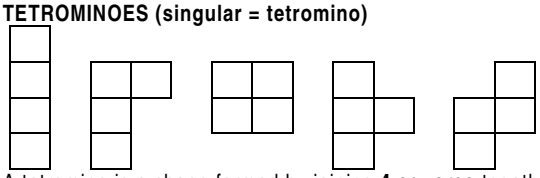
7+(2x6)=19

[Spencer 2000:81]



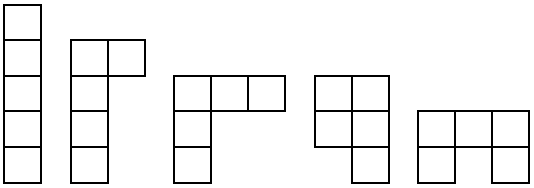
19+(3x6)=37

TETROMINOES (singular = tetromino)



A tetromino is a shape formed by joining **4 squares** together. Ignoring reflections, there are only 5 tetrominoes. [Spencer 2000:14]

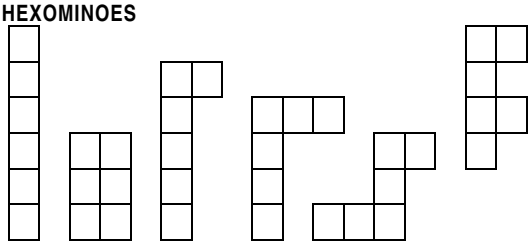
PENTOMINOES



etc.

A pentomino is a shape formed by joining **5 squares** together. Ignoring reflections, there are only 12 pentominoes. What are the rest? [Spencer 2000:14]

HEXOMINOES



etc. A hexomino is a shape formed by joining **6 squares** together. Ignoring reflections, there are only 35 hexominoes. What are the rest? [Spencer 2000:76]

GEOMETRICAL ORDERING REFERENCES:

Gérardin, Lucien (1968). Bionics, trans. Pat Priban, London: World University Library/Weidenfeld and Nicolson.
This book is DEFINITELY for scientists only – instead see the neat designer's explanation provided by Hanks (1977) in "SAFE design" essay.

Motloch, John L. (2001). Introduction to Landscape Design, 2nd edition, New York: John Wiley & Sons.

Rowland, Kurt (1971). Pattern and Shape, No.1 in *Looking and Seeing* series, London/Melbourne: Ginn/F.W. Cheshire.

Simonds, John O. (1997). Landscape Architecture: A manual of Site Planning and Design, 3rd ed., New York: McGraw-Hill.

Spencer, Adam (2000). Book of Numbers, Ringwood, Vic: Penguin Books.

Thompson, D'Arcy Wentworth (1971). On Growth and Form, abridged edition edited by J.T. Bonner, Cambridge, UK: Cambridge University Press.

Chick, David (2000), "Order in Disorder", unpublished student seminar prepared for GDLA unit PSP267 Heritage and Plant Studies, Project 2 Contemporary/Historic Design (submitted as PowerPoint presentation on CD-ROM). Lecturer: Jeannie Sim.

DESIGN #3

There are more visual aspects for a designer to consider, in 4 dimensions (includes time)!

Site Volumes, Visual Landscape & Circulation

Purpose of this section:

- To introduce more ideas about the visual and spatial environment, i.e.
  (A) SITE VOLUMES ex Simonds 1997 chapter 11
  (B) VISUAL LANDSCAPE ex Simonds 1997 chapter 12
  (C) CIRCULATION ex Simonds 1997 chapter 13
- To widen the array of possible references for design theory (i.e. other viewpoints about similar concepts)

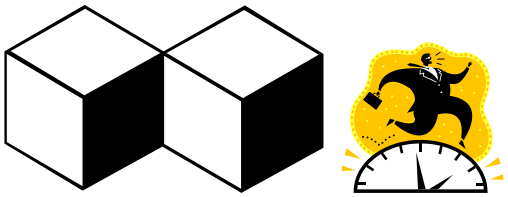
(A) SITE VOLUMES or SPACES...

SITES have ...

- areas (2 dimensions) and
- volumes (3 dimensions).

VOLUMES have...

- base plane
- overhead plane
- verticals
- 4D = time → infers change & movement !



[Simonds 1997: 177-215]

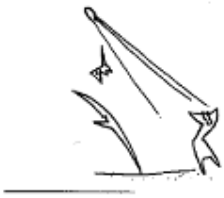
IMPACT of SPACE

- SPACE IMPACTS HUMAN PERCEPTION...
- 85% of perception is VISUAL !
- Designers can create volumes for good or bad (PLEASURE & DISPLEASURE)... but preferably for the GOOD of clients/users...!

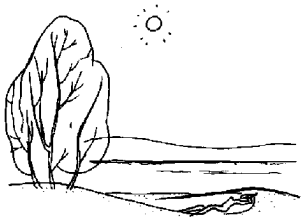
CHARACTER OF SPACE CAN CREATE...

- tension
- relaxation
- fright
- gaiety
- contemplation
- dynamic action
- sensuous love
- sublime, spiritual awe

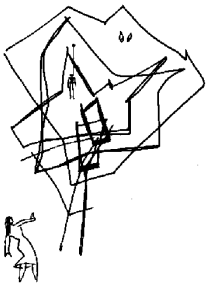
WHAT DO SUCH SPACES LOOK LIKE?
Kinds of spatial impact... [Simonds 1997:179-181]



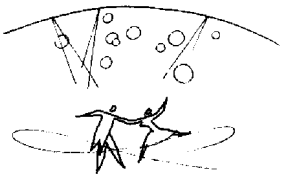
Tension.



Relaxation.



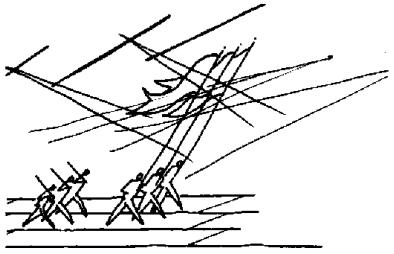
Fright.



Gaiety.

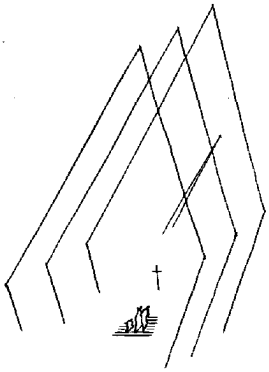
Contemplation.

[Simonds 1997:179-181]



Dynamic action.

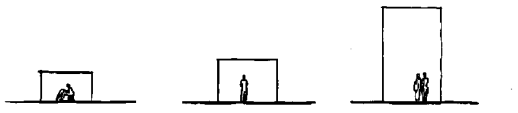
Sensuous love.



Sublime, spiritual awe.

[Simonds 1997:179-181]

SPACE SIZE & PREFERRED USES...

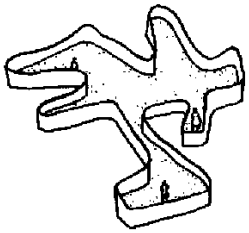


Squat	Sit	Be seated
Eat	Dine	Banquet
Yak	Talk	Converse
Rock 'n' roll	Fox-trot	Waltz
The yodeling three	Light opera	Symphony
Growl at the price of fish	Compare car mileages	Discuss world trade relations

[Simonds 1997:186]

IMPACTS AND ENCLOSURE...

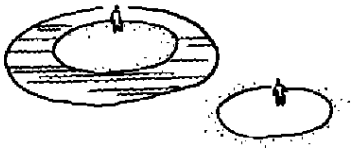
Functions of vertical enclosure. Induced human responses vary with the type and degree of enclosure.



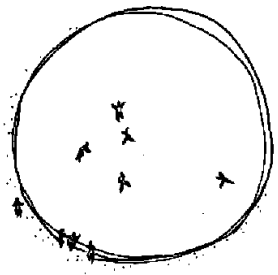
Enclosure may be effectively *implied* by strong demarcation of the base plane.

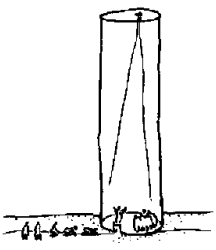
Simple enclosure for concentration on idea, form, and detail.

Complex for excitement, diversion, curiosity, surprise, induced movement.



Confined for relaxation and induced repose.

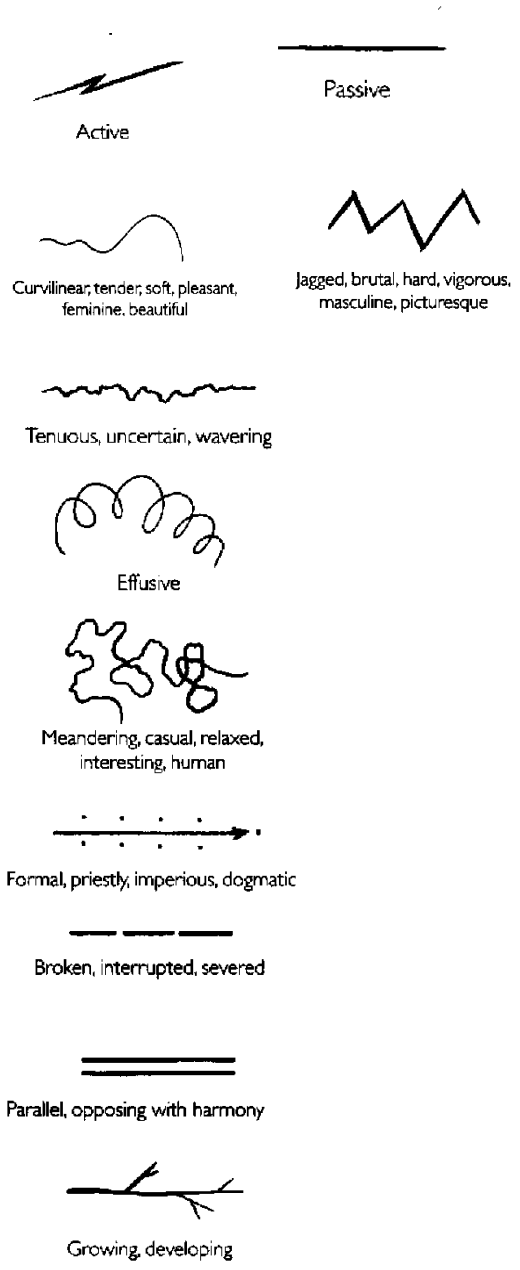




Volumes may be contrived to impart specific pre-determined emotional and intellectual impacts.

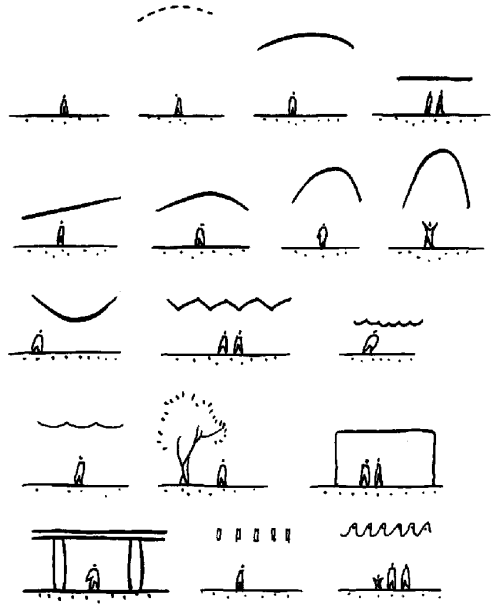
[Simonds 1997:192]

ABSTRACT LINE EXPRESSION...
space character can suggest suitable uses...

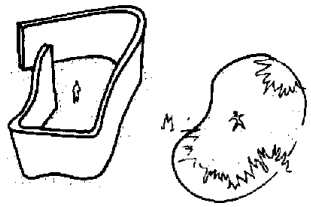


[Simonds 1997:193]

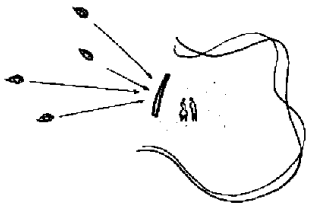
OVERHEAD SPACE DEFINITION...
"The form, height, density, solidity, translucence, reflectivity, sound absorbance, texture, colour, symbolism, and degree of overhead enclosure all have a telling effect on the spatial quality." [Simonds 1997:198]



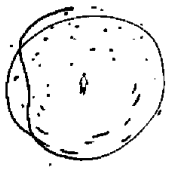
ENCLOSURE & SCREENING ...



Enclosure may be light to solid.



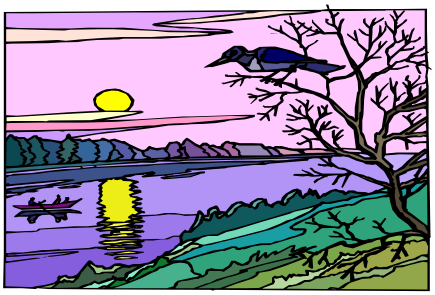
An arc of enframement may give adequate privacy.



Enclosure by dispersed plan elements.

see others→ [Simonds 1997:202]

(B) VISIBLE LANDSCAPE



A VIEW has 2 aspects (in reality or in rendering):

- SPACE
  - perspective (> cone of vision)
  - background
  - middle ground
  - foreground
- LIGHT
  - brightness
  - shade
  - shadow

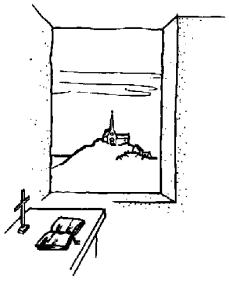
Simonds 1997, Chapter 12, pp. 218-237.

Visible Landscape COMPONENTS

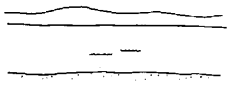
- VIEW: power of suggestion; conceal [hide bad views, or entice with mystery]; reveal [borrowed landscape]
- VISTA: enframement ; terminus (focus)
- AXIS: directional, orderly, dominating
- SYMMETRY:plan elements in equilibrium about a point or area or axis or plane
  e.g. bilateral : trilateral : quadrilateral : multilateral
- ASYMMETRY: irregular, ?closer to nature

Aspects of VIEWS...

→ introducing BORROWED LANDSCAPE (=beyond the property boundary)



A view is a theme that may suggest and give added meaning to well-related functions.



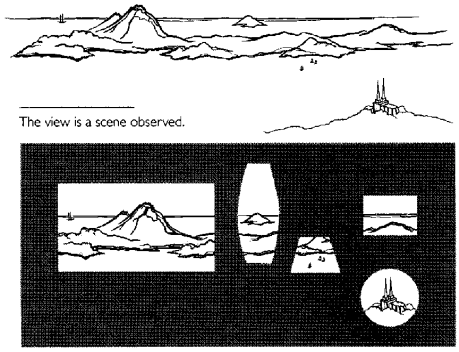
The best view is not always or often the full view.

A view is usually better if enframed or seen through an appropriate screen.

[Simonds 1997:218]

Views & VISTAS...

Human peripheral vision makes real views experienced MUCH BIGGER than a graphic or photographic rendering could ever conjure! → introducing ENFRAMEMENT



The view is a scene observed.

The vista is an enframed segment of a view.

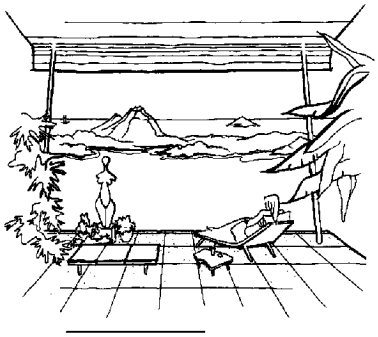
[Simonds 1997:221]

ENFRAMEMENT & Vista compatibility...

Small and cute (twee) artefacts in front of a GRAND LANDSCAPE look silly and detract from the view – ruining the experience of both artefacts & view!

MASSIVE and BRUTAL artefacts in front of a small and dainty view are equally inappropriate.

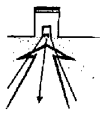
→ interior and exterior designers should be working together!



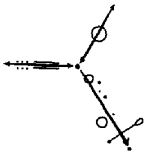
Enframement and vista must be compatible.

[Simonds 1997:221]

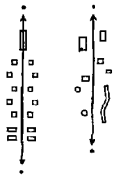
AXIS (plural axes...)



A powerful axis requires a powerful terminus.



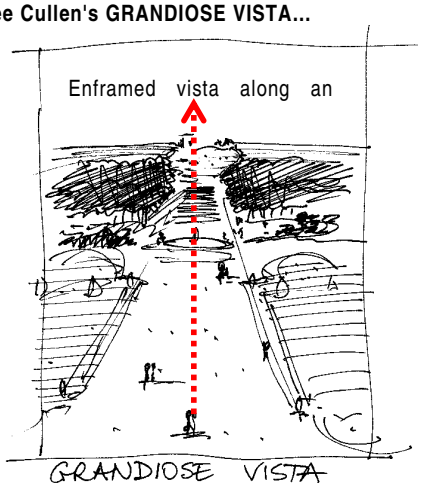
The axis is a unifying element.



An axis may be symmetrical. But usually it is not.

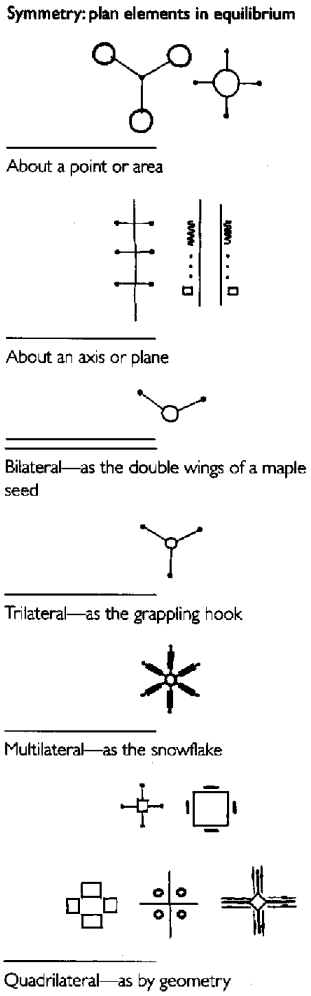
[Simonds 1997:227-228]

Also see Cullen's GRANDIOSE VISTA...



e.g. Palace of Versailles, near Paris, France.

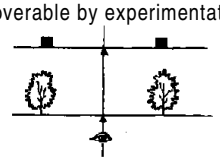
SYMMETRY...



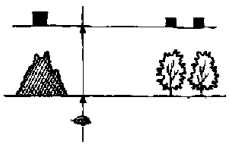
[Simonds 1997:230]

ASYMMETRY... Occult Balance...

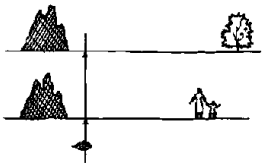
'Occult' means secret, mysterious, or not apparent on mere inspection but discoverable by experimentation.



Symmetrical balance: equal and like masses balanced on either side of an optical axis or fulcrum.



Asymmetrical occult balance: unequal and unlike masses balanced on either side of an optical axis.



Asymmetrical occult balance: equilibrium achieved by mind-eye evaluation of form, mass, value, color, and association.

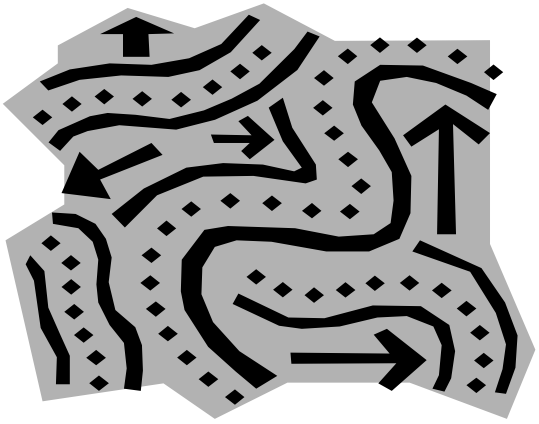
[Simonds 1997:233]

(C) CIRCULATION

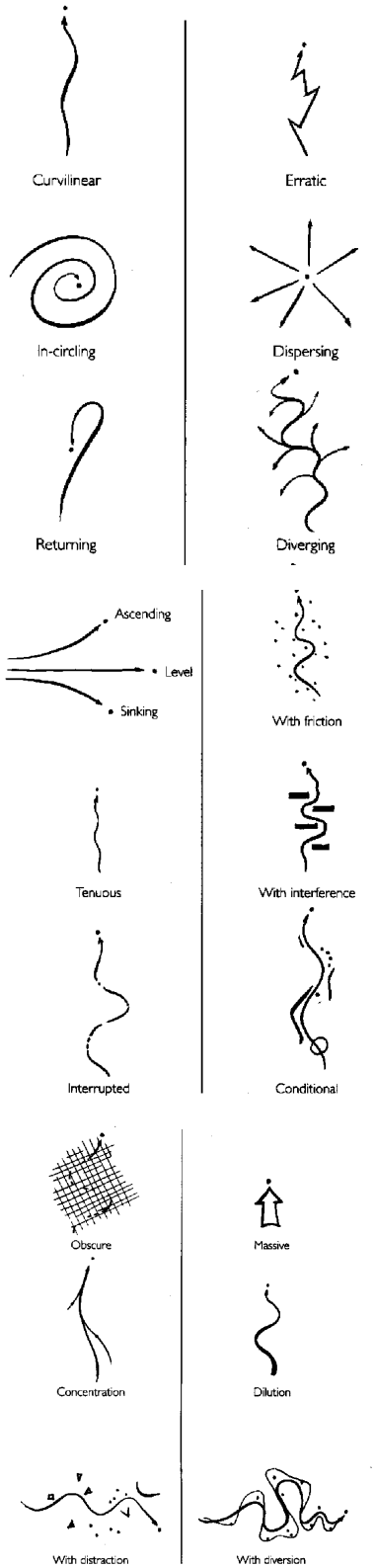
- MOTION is nearly always involved in experience... people, things, nature ... on the move...
- Circulation design includes pedestrian ways, vehicular traffic (bicycle, car, truck, train, tram), equestrian rides, etc.

[Simonds 1997, Chapter 13, pp. 240-277]

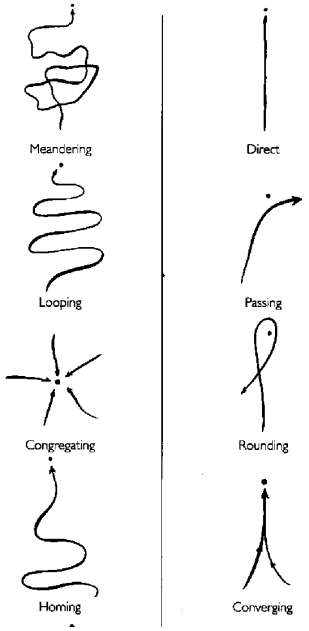
SOME ASPECTS OF CIRCULATION
(1) lines of approach
(2) factors controlling movement through space



Lines of Approach...



[Simonds 1997:241]



[Simonds 1997:241]

(2) CIRCULATION factors: we tend to move...

- along lines of least resistance
- along easiest grades
- toward that which pleases / things wanted / excite curiosity / points of highest contrast
- to attain goal
- toward the beautiful, the picturesque

... as suits our moods or needs
[Simonds 1997:242]

(2) CIRCULATION factors: we are repelled by...

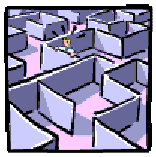
- Obstacles
- steep grades
- the unpleasant
- the monotonous, the uninteresting, the dull, the obvious
- the undesirable
- the forbidding
- the demanding, danger, friction, disorder,
- the ugly, the unsuitable

[Simonds 1997:242]

(2) CIRCULATION: we are directed or guided by...

- implied patterns of circulation
- dynamic plan lines
- Baffles / screens / space dividers
- signs
- symbols
- mechanical controls (gates, kerbs, barriers)...

[Simonds 1997:242]



(2) CIRCULATION: we are induced to repose by...

- Conditions of comfort / enjoyment / rest
- opportunity for privacy or fuller appreciation of view, shape or detail
- restriction of movement, inability to proceed
- imposed indecision
- pleasant arrangements of forms and space
- functions related to rest and repose
- attainment of optimum position.

[Simonds 1997:242]

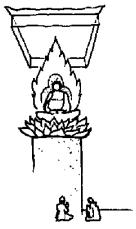
(2) CIRCULATION: motion...
horizontal, downward & upward

- **horizontal motion**:
  easier, freer & more efficient, safer, ... visual interest is in the vertical plane
- **downward motion** or decline:
  easy but care needed, can give sense of refuge, privacy... vision is oriented to the base plane
- **upward motion** or incline/rise/climb:
  hardest but ?exhilarating / sense of accomplishment, implies military advantage, expanding views & vistas... it offers visual interest in the overhead plane, using sun and sky to full effect

[Simonds 1997:244]

(2) Sequence... see also Gordon Cullen's 'Serial Vision'
"Progressive sequential realization of a concept or conditioned attainment of a goal." [Simonds 1997:251]

Start at viewpoint 1, and proceed up the page to the final destination at viewpoint 5.



5

4

3

2

1

Progressive sequential realization of a concept or conditioned attainment of a goal.

Finally...

- The terms used here are further examples of the 'language of art' as applied to the built environment...
- get to know these ideas and practice using the words and the concepts in your design projects...

VOLUMES & CIRCULATION REFERENCE:

Simonds, John O. (1997). Landscape Architecture: A Manual of Site Planning and Design, 3rd edition, New York: McGraw-Hill.

DESIGN #4

There is more than one way to skin a cat, but who would want to?!

Likewise, there is more than one way to design.

Types of Design and Planning Methods

How to design (explaining how design works) is under constant review by researchers and practitioners. There is no one-and-only approach to design. Before exploring design first hand (by doing it), it is worth doing some background investigation. The following essay is only a preliminary overview, but the breadth makes up for the lack of depth. Remember, you are not alone as a designer; you have a cultural and physical context in which and through which you operate. Became aware of these contexts.

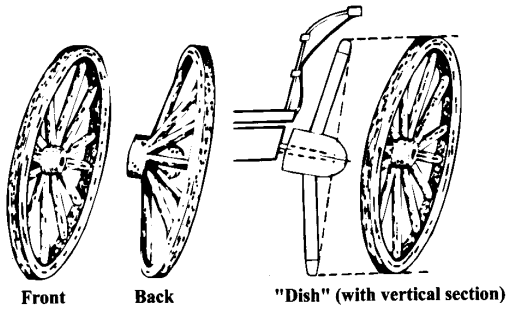
WAYS of DESIGNING

DIFFERENT METHODS PRODUCE DIFFERENT RESULTS
i.e. Means Influence Ends
e.g. Design can be by rough hands and/or smooth hands
Rough Hands ~ workshops & out-of-doors
→traditional up to Middle Ages in Europe & still extant in most of developing world
Smooth Hands ~ office-produced working drawings for implementation by others
→ the modern Western/Industrial tradition of today.

WAY of DESIGN : pre-modern
→By 'ROUGH HANDS'

- apprentice & master (skilled craftworker)
- gradual change because traditional ways preferred

knowledge is taught by "how" a thing should be rather than "why" it needs to be that way.



2 A product of craft evolution, from George Sturt.

[Turner 1996:12]

WAY of DESIGN: modern
→ By 'SMOOTH HANDS'

- design-by-drawing
- based on abstract thought & theory (knowledge of "why")
- implemented by others
- experimentation (change / individuality) actively encouraged
- from Industrial Revolution onwards.

SUMMARY: Who Designs ?
landscape & urban design AUTHORSHIP:
by FOLK CULTURE

- Generalists using 'vernacular' traditions
- using pre-modern, craft-based design methods

by 'CLASSIC' (PROFESSIONAL) CULTURE

- Specialists (landscape architects, planners)
- using modern planning design methods

BOTH GROUPS USE DESIGN TOOLS ! (ie.Visual Elements & Design Principles) → but with different degrees of control/understanding

SOME TYPES of DESIGN METHOD

Various approaches...

- SURVEY-ANALYSIS-DESIGN (SAD)
- PATTERN-ASSISTED DESIGN (PAD)
- METAPHOR,SYMBOL, ALLEGORY
  See TURNER Chapter 7 "Metaphorical Plans"
- plus combinations thereof . . .

1. Survey-Analysis-Design (SAD)

began with Patrick Geddes (1915) who was interested in city planning as a technical (deductive) exercise
"work deductively from the general to the particular" **or** "from the particular to the general" Turner 1996:159

Process:
(1) SURVEY or record existing site conditions

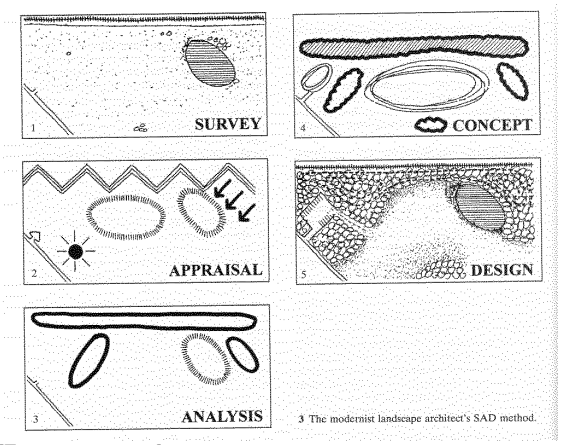
(2) APPRAISAL / ANALYSIS of existing site conditions

- e.g. various techniques/theories
- identify problems & constraints (= challenges)
- identify successes & opportunities
-

(3) CONCEPT and/or SKETCH DESIGNS

(4) FINAL DESIGN.

Refer Turner 1996:141-153

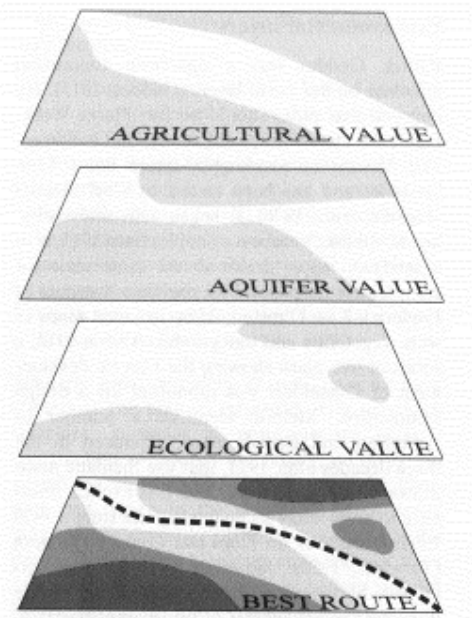


3 The modernist landscape architect's SAD method.

[Turner 1996:146]

"SAD" by McHarg
Deductive approach continued by environmentally aware landscape architect Ian McHarg (1971), Design with Nature:

- empirical ecological approach
- layering constraints to find 'only possible' solution



7 A diagrammatic representation of McHarg's layered planning method.

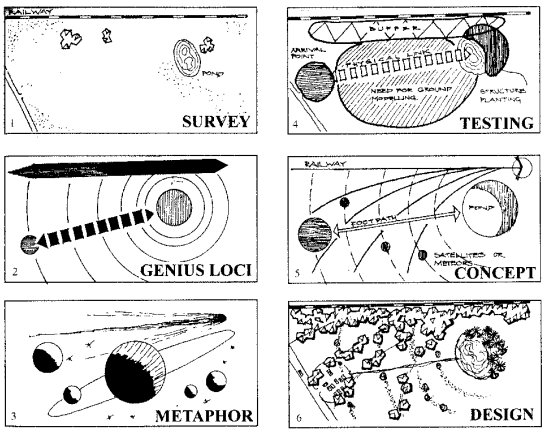
[Turner 1996:58]

2. Metaphor, Symbol, Allegory

Used not as **art for art's sake** but for making places useful & beautiful & interesting

- **Metaphor**
  = "word picture where image completely replaces thing being described ... 'like' and 'as' always used." 'hybrid vigour' when 2 dissimilar things crossed (a creative & sometimes transformative approach); Turner (1996:79-90)
- **Symbol**
  = "something used / regarded as representing something else" [emblem, token, sign]
- **Allegory**
  = "symbolic narrative" [i.e. it tells a story]

(A) METAPHORICAL DESIGN



4 A metaphorical design procedure (by Rob Shakespeare).

[Turner 1996:147]

(B) SYMBOLIC INTERLUDES

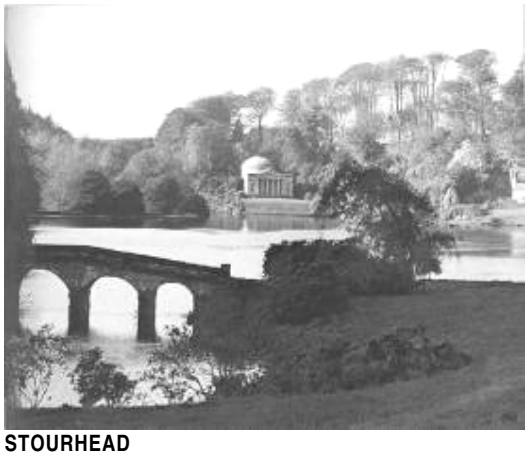
- Maltese cross in pavement (forecourt to Qld Parliament House)
- lions at Chinatown gate, Fortitude Valley cf. lions in front of Brisbane City Hall
- cemeteries & evergreen trees (cypresses, pines); rosemary for remembrance
- Norfolk Island pines on Aussie beaches
- Brisbane City logo = 2 icons (tower & palm tree)
- And what can you think?

(C) ALLEGORICAL GARDENS
Garden design based on a story that can be 'read' by those 'in the know' (educated)... e.g.

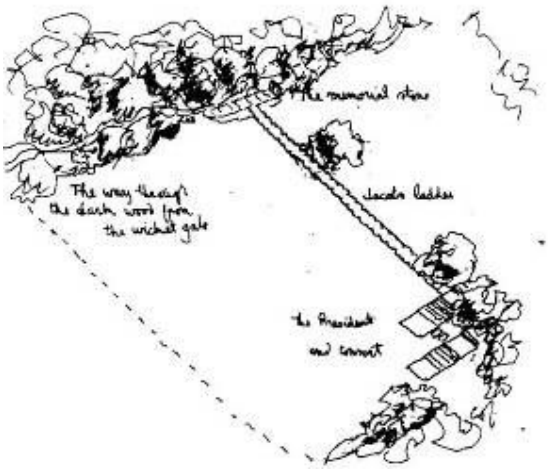
- VILLA D'ESTE, Tivoli, Italy [by Ligorio]
  based on 11th labour of Hercules = to get golden apples from garden of Hesperides (a Ancient Greek Myth)


VILLA D'ESTE, Tivoli, Italy in 16th century
[Image Source; Jellicoe 1995:158]

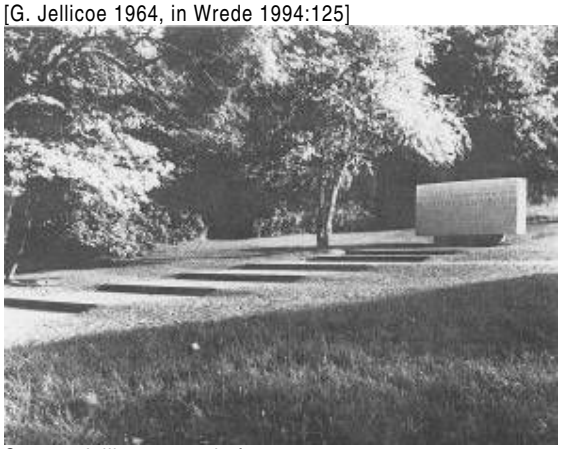
- STOURHEAD, Shropshire, UK
  [by Hoare family] based on Virgil's *Aeneid* (pathway to Grotto etc. = Aeneid's journey to the Underworld)


STOURHEAD
18th century English Landscape School
[Image Source: Jellicoe 1995:241]

- KENNEDY MEMORIAL, Runnymede, UK.
  [by Geoffrey Jellicoe] based on Chaucer's *Pilgrim's Progress*



[G. Jellicoe 1964, in Wrede 1994:125]



Source: Jellicoe 1970: before 27

3. Pattern-Assisted Design (PAD)

Turner's Ideas (see more in section DESIGN #7):

- Primary / NATURAL patterns
- Secondary / HUMAN patterns
- Tertiary / ARTISTIC patterns
- Quaternary / ARCHETYPAL patterns (from Christopher Alexander's Pattern Language)

PAD approaches use these forms of patterns (singly or together) to help generate creative design solutions.
See Turner's examples 1996:203-207 etc.

Times are still changing...
"If landscape design is, to any degree, a fine art, then it simply cannot use a deterministic methodology." Turner 1996:146 [emphasis added]

Remember,
DESIGN APPROACHES ARE CONSTANTLY BEING RETHOUGHT, REVIEWED, AMMENDED.

Some changes in MODERN DESIGN approaches:

- FORDIST PRODUCTION
- POST-FORDIST APPROACHES

↓ influencing planners and designers

- PUBLIC PARTICIPATION in DESIGN & PLANNING

Modern Design : FORDIST

- FORDIST PRODUCTION METHODS: developed by Henry Ford for 'mass production' of automobiles in early 20th C.

[Turner 1996:14]

Modern Design: POST-FORDIST

- POST-FORDIST METHODS: 'lean production' (in use of energy, time & materials) was developed in Japan in late 20th C. & exported back to USA; where
- "shusa is the new supercraftsman, directing a process that now requires too many skills for one person to master" See Turner 1996:15-20

Post Fordist 'Lean Production Team':

- starts large & then contracts
- dedicated & tightly knit
- master plans developed in parallel with component designs
- component makers are full members of design team
- all designers have experience on production line
- customer feedback through car salesmen & car users
- team leader is powerful but seeks agreement of all parties.

Modern Design: PUBLIC PARTICIPATION
APPLYING 'lean production' to BUILT ENVIRONMENT:

- Planners and landscape architects
  use public participation e.g.
- advisory committees
- written comments
- public debate
- design workshops
- for effective planning (to suit the many clients) → 'many plans not one plan'

DESIGNER TYPES

- **HUNTER** = "a single-minded approach, aiming to do one thing and to do it very well"
- **NESTER** = "a broad-minded approach, aiming to take sequential decisions that contribute to a broad set of long-term objectives"
- NESTER-HUNTER = "balanced approach but is not so expert in either of above approaches."

See Turner 1996: 132-137 (Chapter 12)

NOTE: best design teams have both hunters & nesters

HUNTERS VERSUS NESTERS

- typical Modern designer trained as a HUNTER
- typical 'THIRD WORLD' designer a NESTER (skills admired by environmentalists in seeking balanced ecosystems, appropriate lifestyles, recycling of waste products, etc.)
- "the education of nester-designers should result in designer-led design-and-build work, with better craftspeople, more work, more social relevance, and ... higher salaries."

Turner 1996: 137

3 A Burnhamesque question.

[Turner 1996:134]

Choosing a DESIGN METHOD

Depends **on particular project... and**

- your PERSONAL PREFERENCE
  → Turner Ch 12: are you a Nester, Hunter or Nester-Hunter?
- your CONTEXTUAL POLICY
  → Turner Ch 10 are you seeking Identity, Similarity, Difference or a Coalition (with your neighbours)?
- your method of design IMPLEMENTATION
  → Turner Ch 14
  e.g. are you using a sequence of contracts, a single contract or on-site decisions?)

CONCLUSION

***"The is no One Right Way"* to design !**

if the aim of landscape design is TO MAKE GOOD PLACES, the MEANS to achieve this VARY, e.g. sometimes we use . . .

- SAD modernist method
- old craft-based approaches
- art-based methods
- or what ever is needed to get the job done well ?

HOW TO CHOOSE which approach?

Turner says: "Consult the Genius of the Place" and consider the 'pattern' approach (contains inductive & deductive logic). See Turner 1996:153.

The following sections of OTHER viewpoints on how to design and which approach is right for you and the situation.

METHODS REFERENCES:

Many of the ideas in this essay are derived from:

Turner, Tom (1996). City as Landscape: a Post-postmodern view of Design and Planning, London: E & FN Spon,
in particular...
"Chapter 2: Design and Planning Methods"
"Chapter 12: The tragedy of feminine planning and design"
"Chapter 13: The blood of philosopher-kings"

Also refer to the 'classic' text:

McHarg, Ian (1971), Design with Nature, Philadelphia: Falcon Press

Other sources of figures:

Jellicoe, G. (1970), "Chapter 2 The Landscape of Allegory", in Studies in Landscape Design Volume 3, London: Oxford University Press.

Jellicoe, G. and S. Jellicoe (1995), The Landscape of Man, London: Thames & Hudson.

Wrede, Stuart and William Howard Adams (1994), Denatured Visions: Landscape and Culture in the 20th century, New York: MOMA.

DESIGN #5

Exploring design as a problem solving process has been the backbone of Modernist design approaches.

DESIGN AS PROBLEM SOLVING

This section is a composite of extracts from Heath (1989). Who was TOM HEATH? Professor Tom Heath, architect and scholar, was attached to the former school of AIID (now part of DBE) at QUT (1979-98). He once ran a combined introductory design course of ALL BBE students! He passed away in 1998, sadly missed, but his ideas & lecture notes live on. Who could resist such observations as...
"90% of everything is crap!"

MEMORY & DESIGN: Short-Term Memory or **consciousness** – under normal circumstances, we cannot think of more than 7 ± 2 things at once. These limitations on our intelligence and rationality give rise to the need to DESIGN! [Heath 1989:1]

WHAT IS DESIGN? "Design is a process which enables us to decide what to do, under conditions which are too complex for us to visualise all the possibilities, by simulating possible courses of action, and testing these simulations in such a way that the risk of things going badly is considerably reduced." [Heath 1989:2]

Thus, design as PROBLEM SOLVING

PROBLEM SOLVING: Identify the constraints
"A constraint is a proposition which enables us to distinguish between solutions and non-solutions to a given problem"

- **Qualitative & Relational Constraints**
  features on face are qualities but in relation to one and other
- **Internal and external relations**
  internal relation within face but also an external relation to surrounds or setting [Heath 1989:2]

PROBLEM SOLVING: Constraints in context
Reliability of constraints (real v. perceived)

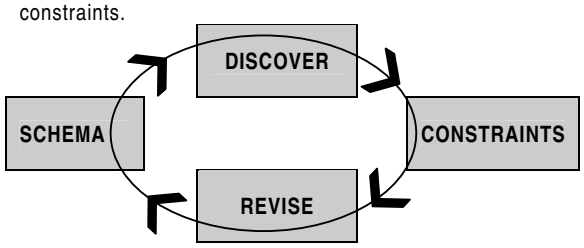
- scientific, technological types [=reasonably reliable]
- economic, moral, political, administrative ... social, cultural [= less reliable or changing]

Optimising & 'satisficing'

- OPTIMUM (or plural, OPTIMA) = the best! & the most difficult to achieve
- SATISFACTORY solutions are usual goal of design

[Heath 1989:3]

PROBLEM SOLVING: 'Schema'
A 'schema' is not a solution but a device for finding constraints.



"Four conditions of constraint:
1. The people concerned don't know what they want.
2. What they want is not very precise.
3. They know exactly what they want.
4. They want contradictory or incompatible things."
[Heath 1989:4-5]

Reitmans' State Transformation Model
A model for problem solving... It is, **A → B** where,
A = some initial state of affairs
B = a final state of affairs
→ = the transformation process which converts A into B
Each of these 3 terms may be KNOWN ; PARTLY KNOWN ; UNKNOWN [Heath 1989:7]

FRAMING A PROBLEM: what problem ?
3 fundamental problem solving STRATEGIES:

- RECOGNITION
- GENERATE and TEST
- HEURISTIC SEARCH

or a combination of these. Heuristic searches are common in design. [Heath 1989:8]

Framing the Problem: RECOGNITION
Maybe used for solving PARTS of design problems. There are 3 methods involved:
1. Knowing the answer [value of past experience!]
2. Knowing where to find the answer [researching databases and other records; libraries; Internet]
3. Knowing how to work out the answer [=ALGORITHM; "a complete set of directions for solving a problem of a given type"] [Heath 1989:8-9]

Framing the Problem: GENERATE & TEST
=TRIAL AND ERROR or randomness / chance [Heath 1989:10].
Selection of this method based on these 4 Limitations (rarely possible for built design problems):

- average effort required to generate each possibility ready for testing
- average effort required to test against all constraints
- total number of possibilities
- LUCK! Maybe the 'satisficing' answer turns up early!

Framing a Problem: HEURISTIC SEARCH
HEURISTIC = "1. serving to find out; furthering investigation. ... 3. Mathematics (of a method of solving problems) one for which no algorithm exists and which therefore depends on deductive or inductive reasoning from past experience of similar problems. ..." Macquarie Dictionary, 3rd edition 1997.

THIS IS THE BEST APPROACH for MOST DESIGN situations!

REASONING

- **Deductive reasoning** = using deduction = [subtraction] "process of drawing a conclusion from something known or assumed"
- **Inductive reasoning** = using induction = "logic process [or conclusion reached] of discovering explanations for a set of facts by estimating the weight of observable evidence in favour of a proposition which (usually) asserts something about an entire class of facts." Macquarie Dictionary, 3rd edition 1997

HEURISTIC SEARCH = 'feeling our way'

"... links the successive trials together according to some overall search plan." [Heath 1989:11-15]

- discover search plan by studying structure of problem
- discover main constraints to discover the system structure
- heuristic methods are not 100% reliable !
- they are only a 'rule-of-thumb' !

JUDGEMENT & SERENDIPITY

Judgement is required when...

- selecting examples & exemplars
- deciding how to break a problem up
- finding the most constrained parts
- selecting powerful constraints
- looking for constraints to relax
- deciding to continue current tack or quit & seek another line of exploration

Serendipity (= happy accident) can happen!
[Heath 1989:16]

SUMMARY : 5 Heuristics

- **State of the art review**
  → What has been done already? Are there exemplars?
- **Buy it or break it**
  → Do you know the answer?... otherwise, break it up
- **Find the structure**
  → What parts ... what connections between them?
- **Find the hierarchy**
  → What parts constrained? Solve them first.
- **Serendipity & divergent thinking**
  → can difficulties be turned to advantages? What if?

[Heath 1989:16]

What Do Designers Do?

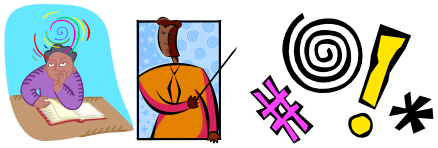
The second section in Heath (1989), draws from John Zeilsel (1981) Inquiry by Design. The purposes if these notes are:

- to introduce Zeilsel's 5 Design Characteristics
- to introduce three elementary activities: imagining / presenting / testing
  → Some Useful Design Habits
- to explore sources of NEW IDEAS (extrapolation & invention; originality in design; organising those sources)
- To explore transforming source material
- To TEST DESIGN IDEAS → V.A.S.T. checklists

ZEILSEL'S 5 DESIGN CHARACTERISTICS
[Heath 1989:17]
(1) three activities → imaging [=imagining], presenting, testing
(2) two types of information → (use data for imagining+testing)
(3) shifting visions of final product
(4) towards a domain of acceptable responses
(5) development through limited cycles: a 'spiral metaphor'

(1) THREE ELEMENTARY ACTIVITIES

- IMAGINING [Zeisel used the word 'imaging'] – forming the 'fuzzy mental picture' or SCHEMA (Heath's preferred term) [Heath 1989:17]
- PRESENTING – presenting records & communicates schema eg. sketching, models, diagrams, writing, talking... 'externalising images'
- TESTING – matching current schema to constraints →modifying or rejecting as needed



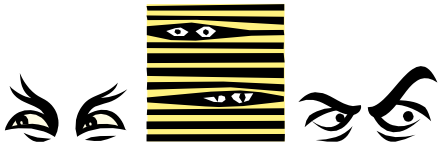
(2) TWO TYPES OF INFORMATION

- using data for imagining & testing... "as a heuristic catalyst for imaging and as a body of knowledge for testing"
- i.e. heuristic catalyst = most data can be used in "what if..." scenario of imagination

REMINDER: heuristic means...
"1. Serving to find out; furthering investigation.
2. (of a teaching method) encouraging students to discover for themselves..."
[Macquarie Dictionary (1997) 3rd edition]

(3) SHIFTING VISIONS

Shifting visions of final product as schema are adapted or renewed... "Design is a learning process. Like other learning processes it requires a mixture of excitement (what if) and discipline (no, that won't do). Rigidity of thinking and excessive vagueness are both bad design strategies. Design is about changing one's vision of the situation until it encompasses a solution." [Heath 1989:19]



(4) ACCEPTABLE RESPONSES

- Zeisel's 'domain of acceptable response' = Heath's 'solution space' [Heath 1989:18-19]
- their opposite = 'acceptable risk of failing' (heavy responsibility when wrong decisions can mean legal penalties!)
- reminder... "Design exists to stop things going wrong." ACCEPTABILITY means the least possible error...

(5) 'SPIRAL METAPHOR'

- DESIGN DEVELOPMENT SPIRAL
  = consecutive image-present-test cycles converging on domain of acceptable responses

OTHER ASPECTS OF DESIGNERS' BEHAVIOUR:

- Designers BACKTRACK
- FOCUS SHIFTS
- HOMING-IN to SOLUTION

"... design is an heuristic process and cannot proceed with certainty." [Heath 1989:19]

SOME USEFUL DESIGN HABITS

- **Freehand sketching** precise drawing takes too long or too involved for an idea that may be discarded
- **'Thumbnail' sketches** (small scale) enlarge only promising ideas
- **Overlay sketching** transparent paper allows comparison of ideas & minimises 'setting up' time
- **Drawing to approximate scale** also avoids wasting time; correct later
- **Numbering sketches in sequence** this is about organising all those accrued ideas

[Heath 1989:20]

IMAGINING: where do new ideas come from?

2 MAJOR SOURCES of NEW IDEAS (especially regarding scientific & technical inventions)...

- EXTRAPOLATION [="to infer from that which is known"] modifying some existing situation e.g. new aircraft often wider or larger versions of old ones
- INVENTION – combining 2, 3 or more existing ideas in new ways e.g. Wright Bros. aeroplane
  = ship's propeller + car engine + glider wings

[Heath 1989:20-21]

ORIGINALITY IN DESIGN

Innovative design can ALSO combine existing ideas in new ways... → startling results occur when things are combined that seem unrelated ...

To be an ORIGINAL DESIGNER requires:

- Unusually WIDE RANGE OF EXPERIENCE, often in quite different fields
- Ability to see the CONNECTION between apparently UNRELATED ideas. [Heath 1989:21]

SOURCES OF IDEAS (learning to imagine)

Listed in 'probable' order of USEFULNESS...

- FINISHED PRODUCTS in your field of design (or buildings, interiors, landscape or urban settings)
- OTHER ARTIFACTS, e.g. works of art
- GEOMETRY [graphic patterns!]
- BEHAVIOUR PATTERNS
- NATURE (land, plant, or animal form, & behaviour)
- LITERATURE (especially imaginative [speculative] sorts)

THUS to help your short term memory, ASSEMBLE examples or a 'stock of images' : books, magazines, scrap books, photos, sketches... ie. DAYBOOKS! [Heath 1989:22]

Organise your IDEAS SOURCE MATERIAL

[Heath 1989:22-23] INDEX your source material !!!!

Forms of organisation/classification...

- historical development of forms
- typological – classified by name [form]
- behavioural / functional – classified by use or purpose
- classified by shape or organisation
- symbolic / expressive – classified by meaning
- structural – what gives it strength?
- process – how produced/made?
- experiential / phenomenological – how feel about it?

NOTE: Piles of old photocopies do not help!
You need to be able to RETRIEVE your data!

TRANSFORMING SOURCE MATERIAL

Transforming processes (borrowing those ideas):

- METRIC: enlargement/reduction of whole/parts
- CARICATURE: also uses enlarged/reduced parts
- ADDITIVE/SUBTRACTIVE: add on or cut off
- REFLECTIONS & SYMMETRIES: reverse, rotate, invert or multiply whole or parts
- CHANGE CONTEXT: use commonplace element for unusual purpose; or unusual element for commonplace purpose
- ANALOGY/SYMBOLIC: e.g. caryatids as columns
- COMBINIONATORIAL [!]: bits of the above !

[Heath 1989:23-24]

Practicing Transformations

CREATIVITY... transformation processes under various names:

- divergent thinking
- lateral thinking
- displacement concepts

LEARN to be an IMAGINATIVE! CREATIVE! ORIGINAL! DESIGNER... how? by developing certain mental/physical habits through practice... constantly seeking out images & ideas [librarian speak = 'current awareness strategy'] [Heath 1989:24].

TESTING DESIGN IDEAS

- BEWARE of becoming so attached to an idea that you AVOID testing it against constraints...
  be critical, be honest, keep testing CONTINUOUSLY
- CHECKLISTS can be used to locate those likely constraints on design ideas [Heath 1989:24-25].

NB. Most modern scholars & designers believe that checklists are dangerously prescriptive: but for newcomers to design (i.e. students), they can be invaluable! Simply, use them with **critical discretion**, as you should any of the theory introduced to you!

Limitations on representation of design processes...

IDEAL is to be simple, general and precise...
NOT POSSIBLE! e.g. Sign in engineer's office:
"We provide a service which is QUICK; CHEAP; ACCURATE. Pick any TWO."
To be precise = use an **ALGORITHM**...
"an effective procedure for solving a particular mathematical problem in a finite number of steps". Macquarie Dictionary
HOWEVER, design processes are NOT algorithmic...
[Heath 1989:43]

REFERENCES:

HEATH, TOM (1989). Introduction to Design Theory, QUT publication, especially
"Part 1, What is Design?"
"Part 2, What do designers do?"
"Part 3, A General Design Heuristic"

Also read the Obituary article by Golden Holden, "Tom Heath" in Architecture Australia, Sept/Oct 1998, pg. 34.

DESIGN #6

What is S.A.F.E. design ?

SIMPLE
APPROPRIATE
FUNCTIONAL
ECONOMICAL

S.A.F.E. Design Approach

This essay explores these components of SAFE design as well as the following essentials in the creative process:

- thinking
- ideation
- problem solving

DESIGN... more than architecture or landscape
HERE'S AN OLD 1970s DESIGN TEXTBOOK:
Kurt Hanks, Larry Belliston & Dave Edwards (1977). Design Yourself!. Los Altos, CA: William Kaufmann Inc.

There are some interesting ideas in here – you should be able to benefit from them even if the actual text is out of print and not in the library!

This book was aimed at all sorts of designers, which reminds us that there is more than one way to skin a cat – what a horrible notion! That is, there is more than one way to describe and undertake the design process.

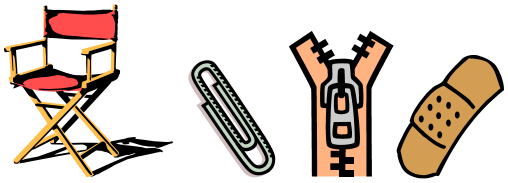
S.A.F.E. DESIGN

DESIGN IS ABOUT OPTIMISING! Say and do only what is necessary: "simplify, summarise and stop" (Hanks 1977:36-39). This kind of design approach is essentially a MODERNIST APPROACH.

S.A.F.E.: → SIMPLE

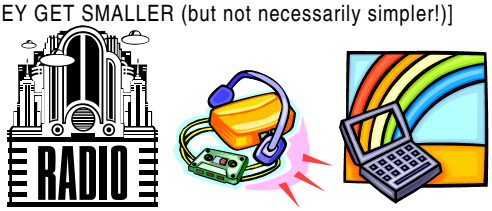
Aim for simple design solutions that are minimal in form but maximize their usefulness or effect. Some examples:

- Director's chair
- Paper clip
- Band-aid
- Zipper



Also in this group would be early MODERNIST corporate 'logos'.

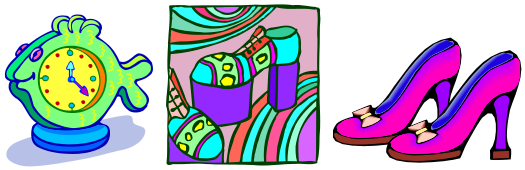
But simple design is also dependent on available technology: compare on old 1920s radio to 1990s 'Walkman' radio! , or old 1970s computers in whole rooms to today's laptops! [THEY GET SMALLER (but not necessarily simpler!)]

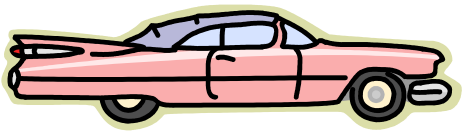


S.A.F.E.: → APPROPRIATE

Aim for what is an appropriate design solution: "Look at final design solution setting and how your design will fit into it." (Hanks 1977:45). "Is the design honest if it is trying to be something it is not." (Hanks 1977:47).
Most Modernists were/are very conscious of achieving 'honesty in materials', albeit less common to find a call for contextual appropriateness. The crazy kitsch popular culture so admired by 'hip' folk today was openly abhorred by so-called good designers (but not the general public)! Examples of such naughtiness in design terms (according to Hanks and other Modernists) include:

- clock in [Venus de Milo] statuette's tummy!
- high-heels and platform shoes!
- elaborate fins on cars!

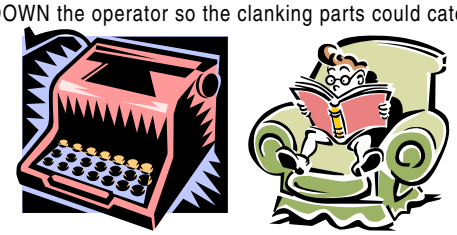




S.A.F.E.: FUNCTIONAL

Achieving a functional design is more than "it works"! Here are some important components of functional designs:

- Use the correct size type or font to read otherwise you can't read it! This is very tiny text at 4pt!
- 'QWERTY' keyboards: not a natural sequence of the alphabet! So why adopted as the standard? Because early mechanical typewriters were designed to SLOW DOWN the operator so the clanking parts could catch up!

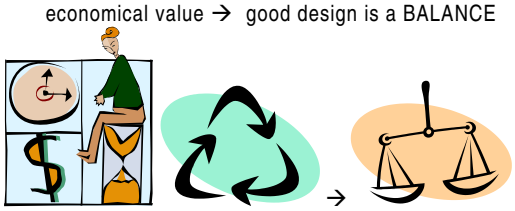


- Correct anthropometric fit (appropriate for age, gender, etc.)
- Psycho-social need to personalise and to have privacy spaces, which goes beyond how people USE spaces ot things
- Avoid using signs that are too simple to be read properly: e.g. avoid the overly discrete signage for fire extinguisher or exit!

SAFE: **ECONOMICAL**

Achieving an economic design is more than just a cheap cost. We need to consider the demand/cost ratio; and factors of use, price and need.

- DO MORE WITH LESS → recycle!
  "one person's rubbish is another person's treasure"
- Don't over-economise to the point where the final product has no value
- often appropriateness & functionality determine economical value → good design is a BALANCE



- be careful that cheap construction costs don't become expensive maintenance costs.

WHAT IS "GOOD DESIGN"

To achieve 'GOOD DESIGN' depends on the CONTEXT. "Good design is the best solution to a given problem. To have something look good should not be the most important consideration all the time." (Hanks 1977:56). For example we can consider the DESIGN PROCESS. What questions would a graphic designer ask to set the APPROPRIATE PARAMETERS for their problem? They would include: What is budget? How much detail needed? Who will read it? Used in what setting ? For what purpose? These same contextual questions arise for other designers, e.g. and what if it was a design challenge about clothing or a garden or an office interior?

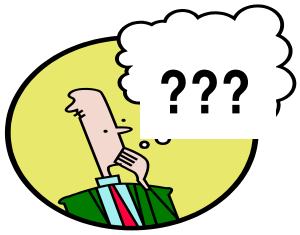
The answer is to apply S.A.F.E. design principles to...

OPTIMIZE YOUR SOLUTION !

THINKING

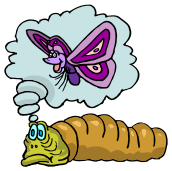
The following ASPECTS OF CREATIVE THINKING will be discussed:

(1) Drawing
(2) Mental Practice
(3) Visual Thinking
(4) Blocks
(5) Bugs
(6) Numb Person
(7) Pre-Judgement
(8) Tags
(9) Habit
(10) Fear
(11) Preciousness



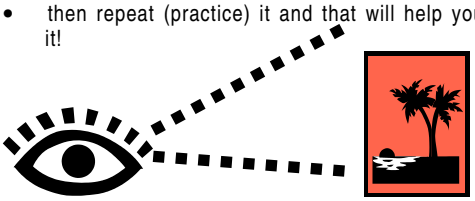
(1) Thinking: DRAWING

- can be a way to understanding
- it can help you understand the structure & function of items (see more in section DESIGN #8)
- there are many different sorts of drawings, from manufacturers' instruction sheets or discovering anatomy with da Vinci
- YOU THINK IN PICTURES! Not words!



(2) Thinking: MENTAL PRACTICE

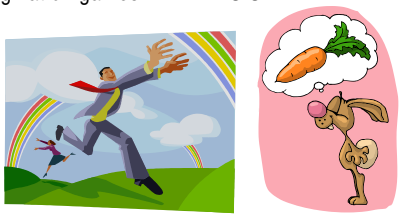
- vizualise that target, say the sportspeople!
- visualize getting slimmer, more confident, etc. say the New-Age people!
- Get a clear mental picture of what you want,
- then repeat (practice) it and that will help you achieve it!



(3) Thinking: VISUAL THINKING

This can lead to better problem solving; Albert Einstein used it! Here are some ways to promote visual thinking:

- Daydreaming:
  set aside 5-15 mins/day &
  record those fleeting ideas & visions in a JOURNAL
- Night Dreaming:
  keep a record of those you remember
- Imagination games – FANTASISE !

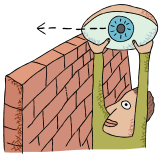


(4) Thinking: BLOCKS

"Blocks are mental walls which do not allow people to correctly perceive a problem or conceive its solution" (Hanks 1977:77).

Some sorts of blocks are:

- tendency to limit a problem too closely
- isolating a problem
- stereotyping
- saturation
- failure to use sensory inputs



(5) Thinking: BUGS

"Bugs are mental walls created by learned cultural or environmental standards which do not allow people to correctly or efficiently solve problems" (Hanks 1977:78).

Some sorts of bugs:

- taboos
- devaluing daydreaming
- believing that intuition and feelings are bad
- tradition opposes change
- assigned cultural & social values
- environmental blocks

(6) Thinking: NUMB PERSON

"people often isolate themselves from their surroundings; this makes them set in their ways." (Hanks 1977: 80).

- take time to listen to your senses → smell the flowers!
- our attitudes to change are governed by our awareness

"The tragedy of life is not that we die but is what dies inside a man while he lives." –Albert Schweitzer

(7) Thinking: PRE-JUDGEMENT
"Prejudging a situation is another frequently occurring obstacle to progressive, creative or new behaviour." (Hanks 1977:82).

- Avoid judgements when free-wheel brainstorming!
- **Avoid negative criticism!** (from yourself and others – negative comments on other folks' concepts or actions is a **cheap** way to attempt to demonstrate mental superiority!)

Remember:
AVOID PRE-JUDGING &
NEGATIVE CRITICISM

(8) Thinking: TAGS
"We have a tendency to label items in our environment with names or tags which limit our understanding or acceptance of [them]." (Hanks 1977:83).

- tags often stay put once there
- tags are usually superficial e.g.
  beauty is only skin deep
  don't judge a book by its cover

(9) Thinking: HABITS
"Habits are like having concrete poured into your ear – when it sets, your sunk!" (Hanks 1977:84).
ie. be careful of BAD HABITS! The first design forms of the motorcar resembled the horse-drawn carriage...
Each design problem deserves your **OPTIMISTIC VIGOUR !**

(10) Thinking: FEAR
"Fear is one of the major blocks to effective problem-solving and creative thinking." (Hanks 1977:85).

- fear of criticism
- fear of letting someone down
- fear of trying something new

Yikes!

"...it is better to have tried and blown it that to have never tried at all. –Ima Success."

(11) Thinking: PRECIOUSNESS

- Don't marry your problem.
- Don't get too attached... You need to separate yourself from the problem to find those alternative answers
- For example: the truck that got stuck under the underpass... the passing child knew how to get it out, while the driver could only think of heavy & expensive interventions!

What is the answer?

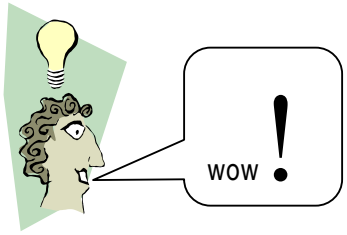
(12) Thinking: SUPERBEING SYNDROME
"Excessive pride blurs vision of reality." (Hanks 1977:87)
"Moderation in all things - not too self-confident nor too shy."

Similarly, seeking perfection in ALL things can result in no product

IDEATION

Ideation is the process of getting good ideas. For example:

- brainstorming
- lists
- Ah-Ha!
- Projection
- Synectics
- Bionics



(1) Ideation: BRAINSTORMING
Hanks (1977:108-9) describes a typical session:

- think first – judge later!
- the wilder the ideas the better
- quantity is wanted
- combine, improve & expand ideas
- take short recesses or breaks
- evaluate your ideas
- DO SOMETHING ABOUT IT!

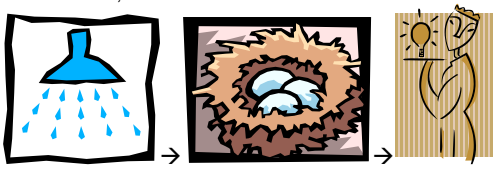
(2) Ideation: LISTS
Hanks (1977: 110-113) lists lots of helpful action verbs, evaluation questions, options, etc...

REMEMBER: checklists can help you get into the problem [but they are NOT THE SOLUTION!]

(3) Ideation: AH-HA! Principle
Hanks (1997:114) describes this as that sudden insight into a problem you have been wrestling with, like Isaac Newton & the Apple... So when you have an idea, **WRITE IT DOWN!** This is yet another plug for keeping design journals!

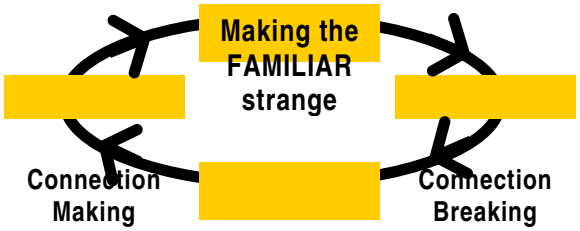

"Fortune favours the prepared mind."
– Louis Pasteur

Hanks also described the analogy of the sponge, the egg and the idea, i.e. saturate + incubate = ideate!



(4) Ideation: PROJECTION
Hanks (1977:116-7) recommends that you change your point of view to 'become' the person you are designing for: "Put yourself into your chosen activity. See your world, and that around you, from the outside in and the inside out." In other words, put yourself in someone else's shoes!

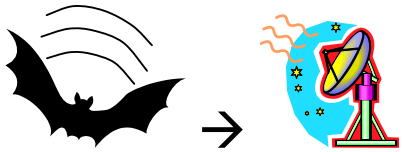
(5) Ideation: SYNECTICS
This methods (Hanks 1997:121-5) is for looking at problems in new & creative ways, over and over again.



Making the STRANGE familiar

There are 4 methods to make the familiar seem strange:
- personal analogy → become the bird, or electricity, etc
- direct analogy, e.g.
  → Engineer Brunel's underwater tunnels = based on the shipworm borrowing in wood;
  → Inventor Edison's telephone = based on human ear bones & drum
- fantasy analogy → such as an artist's wish-fulfilment
- symbolic analogy

(7) Ideation: BIONICS
Hanks (1977:126-9) describes Bionics as applying the ingenious inventions of nature to human-made things via adaptation. For example
- radar of bats



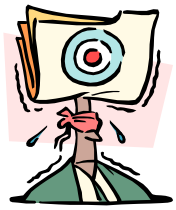
- depth control of fish
- camera light meters (like human eye)
- hypodermic fangs on snakes
- jet propelled squids!
- visual concealment (camouflage)
- VELCRO (like burdock burr), etc.

Please don't make the classic Human error of thinking burrs are like Velcro! Burrs came first! We copied!

Also refer to bionics in Chap. 8 in Papanek (2000):186-214.

PROBLEM SOLVING

The topics covered below include:
(1) What is the PROBLEM?
(2) Find the essence of the problem
(3) Breaking up is easy to do
(4) Information
(5) Values
(6) Design a method!



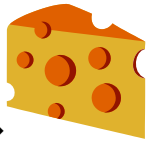
"A Man without a goal is like shooting a gun without a target.
– Benjamin Franklin"

(1) WHAT IS THE PROBLEM?
1 **recognise** & **accept** problem
2 **understand** the problem
3 **set some goals** to help solve the problem
4 **ideation** - searching for new ways of possibly attaining the major goals
5 **selection** - best possible ways of solving the problem
6 **implementation** - put into action your 'best ways'
7 **evaluation** - what are effects/results of solution

Thinking is like a SPIRAL, almost circular in nature.

What is the problem? To answer the question remember:
- Find those central themes or the essence of the problem
- Treat the cause not the symptoms → attack to essence of the problem not just the results of the problem

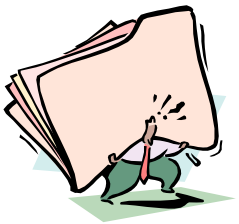
(2) Breaking Up Is Easy To Do
(Hanks 1997:98)
Attacking the problem in one bite can be too much, so break it up into manageable parts !



or 'Swiss Cheese it!'→
If the problem seems too big to tackle, nibble away at it (deal with small parts of the whole), until it resembles Swiss cheese and the whole is a size you can tackle!

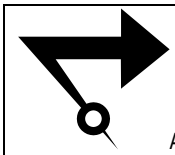
(3) INFORMATION
(Hanks 1997:100)

- the more information we have the better chance of a good solution
- you can't drink from an empty bucket!
- Keep an open mind
- learn from others
- read & listen
- try new things
- experience



- [but watch out for information overload!]

(4) VALUES
(Hanks 1997:101)
Learn to evaluate information appropriately
→ to assess its value for problem solving
discard the unnecessary data - what is relevant, what is not and what is its usefulness?



Aside: **What is DATA?** (Evans 1995:89-90)

"Data + test hypotheses = **INFORMATION**
(what the data means).

Information + conclusions = **KNOWLEDGE**.

Knowledge + integration (into way of thinking) = **WISDOM**."

(5) Design a Method
(Hanks 1997:102-104).
"There're as many methods of solving problems as there are problems."

- Plan your work & Work your plan
- gameplans and wargames; strategic planning for battles...
  e.g. have you read this excellent science fiction novel that many business schools have as a set text to spice up their reading lists on management?

→ "Ender's Game" by Orson Scott Card ←

i.e. Humans versus giant bugs!

Finally... PROBLEM-SOLVING REMINDER:

- Look at the problem
- Develop a plan to solve it
- Work at the plan
- Evaluate your plan

S.A.F.E. DESIGN REFERENCES:
Evans, David (1995). How to write a Better Thesis or Report. Melbourne: Melbourne University Press.

Kurt Hanks, Larry Belliston & Dave Edwards (1977). Design Yourself! Los Altos, CA: William Kaufmann Inc.

Papanek, Victor (2000). Design for the Real World, 2nd revised edition. London: Thames & Hudson.

DESIGN #7

Patterns are all around us: in nature and the built environment. We can understand and use patterns to make better and more interesting designs.

Pattern Assisted Design (PAD)

Purpose of section is to become familiar with...

- WHAT ARE PATTERNS?
- CLASSIFYING PATTERNS
- DIMENSIONAL PATTERNS
- FIGURE / GROUND PATTERNS
- TURNER'S ARCHYTYPES (groups of PATTERNS)
- USES OF PATTERNS IN DESIGN
- Pattern Assisted Design (PAD)

WHAT ARE PATTERNS?

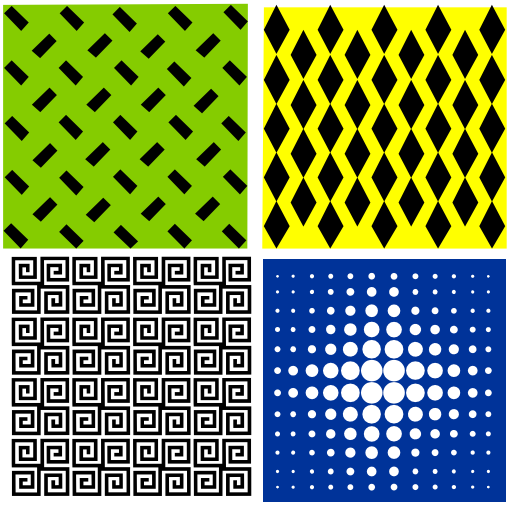
There are many applications or meanings of the word patterns, including:

- a decorative design
- a style or type in general
- a model or example from which to make copies
- a motif in repetition, and so on.

CLASSIFYING PATTERNS

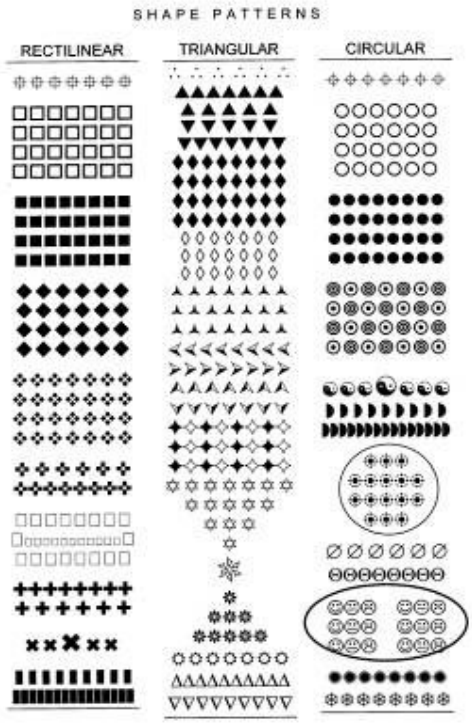
For design purposes, this essay explores several kinds of patterns, three of many others that are possible. These include:

- Dimensional patterns (→ Euclidian geometry)
- 2D, 3D & 4D
- Figure / Ground patterns
- Tom Turner's 4 types of patterns (Primary, Secondary, Tertiary & Quaternary).



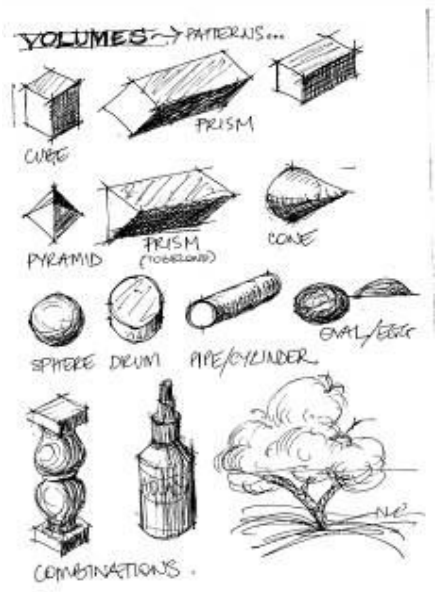
(1) DIMENSIONAL PATTERNS

2 DIMENSIONAL = shapes



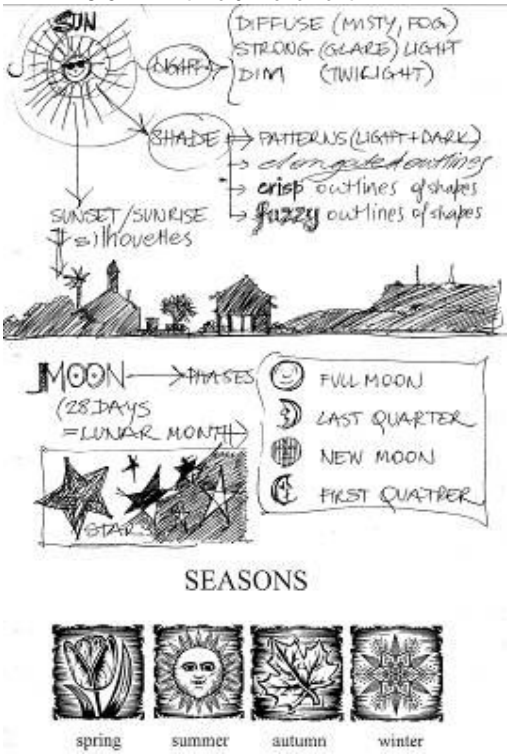
There are also freeform SHAPES and combinations of rectilinear, triangular or circular geometries).

3 DIMENSIONAL = volumes



Again, there are freeform FORMS and combinations of cubic/prismatic, pyramidal, spherical, tubular and drum forms.

4 DIMENSIONAL = time & movement



MOVEMENT through space can vary: fast or slow, smooth or jerky, upwards, downwards and so. Each mode effects the experience of the space and things within that space.

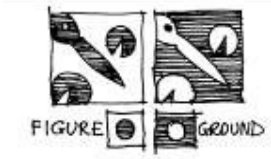
TIME can be experienced at various scales and be marked by observations of the changes and events that occur during that period. These changes include:

- solar patterns (day & night)
- lunar patterns (over month)
- seasonal patterns (over year)
- generational patterns, etc.

(2) FIGURE / GROUND patterns

Using figure/ground plans are an abstract representational technique for urban form analysis and design.

figure = solid = mass ■
ground = void = space ○



Reference: Cooper, Wayne (1983) "The Figure/Grounds" The Cornell Journal of Architecture 3: 42-53

FIGURE / GROUND for urban form analysis & design

Here are a few observations about using figure/ground analysis.

"the medieval voids cut out of solids as contrasted with the modern solids placed in a void." [Cooper pg. 44]

"If history is a continuum, then the notion of context may be effectively argued and may reasonably demand attention." [Cooper pg. 53]

"One wants to improve what has been built, and not to spoil what is yet to be done." [Alberti]

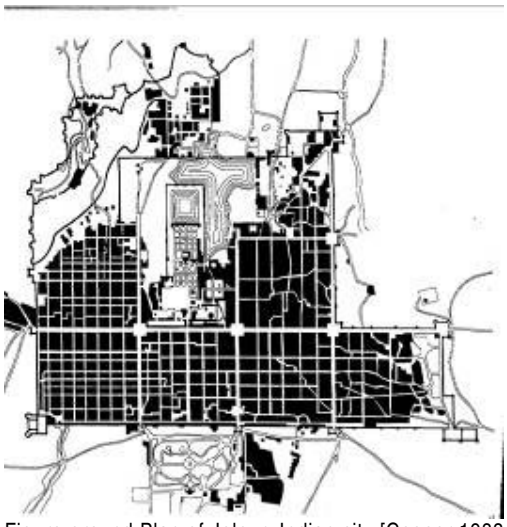
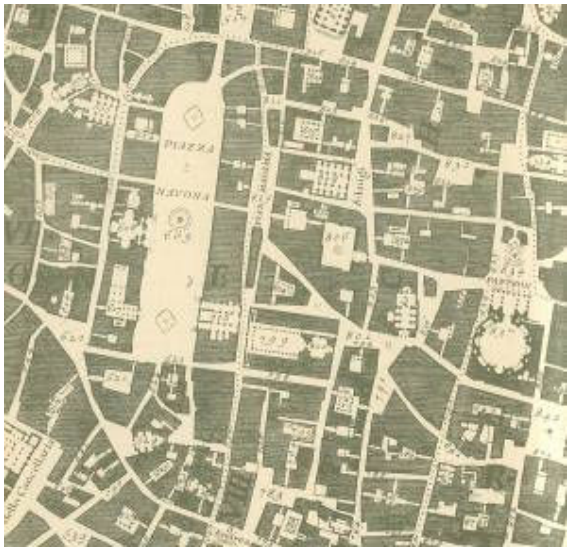


Figure-ground Plan of Jolpur, Indian city [Cooper 1983:47].

One of the first figure-ground plans of a city was of Rome by Italian Giambattista **Nolli** published in 1748. He considered the continuous free access to churches to be in the same category as open space, hence these buildings were drawn as 'ground' or white space.

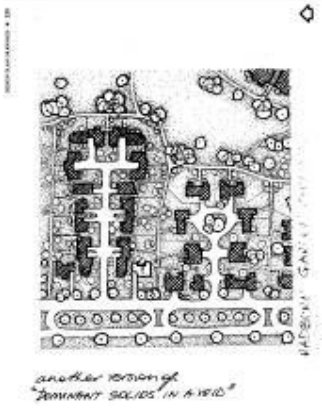


Extracts, Nolli's plan of Rome, endpapers in Mauduit 1989.

SOLID & VOID RELATIONSHIPS (mass and space)
Some issues:

- DOMINANT SOLIDS (mass) in a void (space)
- DOMINANT VOIDS (spaces) shaped by solids (masses)
- REVERSIBILITY (e.g. white objects in black background)
- HIERARCHY: inside / outside / between

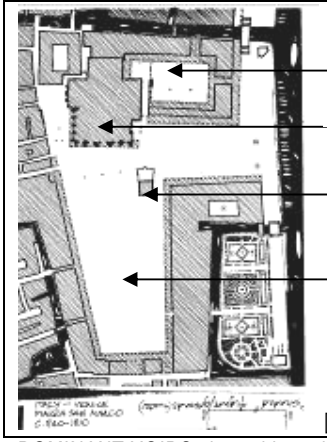
[Cooper 1983]



Radburn
Garden City,
New Jersey

[Mann 1993:225]

DOMINANT SOLIDS in a void



Doge's Palace

San Marco church

Belltower

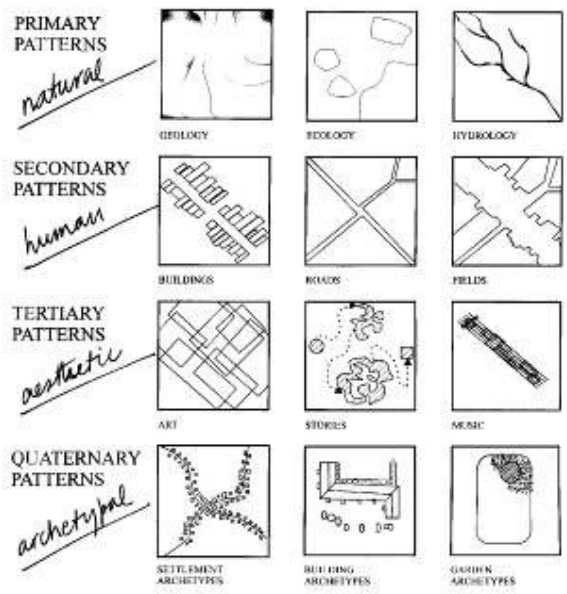
Piazza San Marco
(St. Mark's Square)

[Mann 1993:149]

DOMINANT VOIDS shaped by solids

(3) TURNER'S Types of Patterns

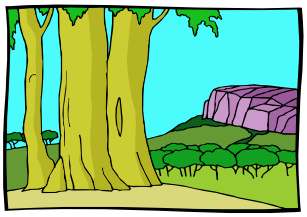
SOURCE: Tom Turner's City as Landscape (1996 : 34-36)

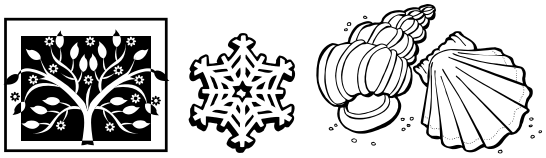


[Turner 1996:34]

PRIMARY = natural patterns

- GEOLOGY → shown on maps; e.g. rock strata, soil types
- ECOLOGY → shown on maps; e.g. patches & corridors of vegetation etc.
- HYDROLOGY → shown on maps; e.g. rivers, lakes, oceans
- BIOLOGY → plant/animal forms and growth patterns

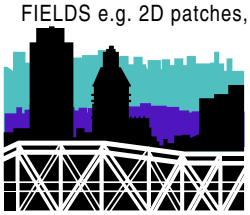


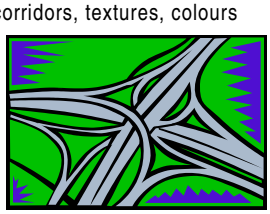


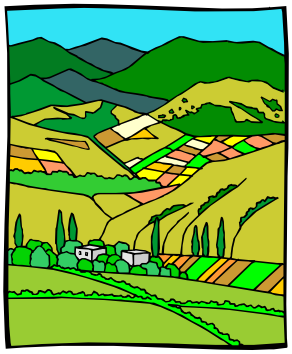
See more in section DESIGN #2.

SECONDARY = human patterns

- BUILDINGS e.g. 3D volumes & 2D figure/ground games
- ROADS e.g. 2D linear networks, prioritised sizes
- FIELDS e.g. 2D patches, corridors, textures, colours







Field patterns

TERTIARY = aesthetic patterns

- ART – both innovative creations and design pattern books!
- STORIES – morals explained by parables, myths, legends, fairy stories etc.
- MUSIC . . . etc.

"They may derive from geometry, mathematics, decoration, representation, mythology, symbolism, allegory, metaphor, abstraction, philosophy, poetry, music and narrative." Turner 1996:34

→ e.g. indigenous stories and art:

Zane Saunders "Spoonbill Tell Me a Story" (1995-96) linocut on paper [Postcard ex QAG].

QUATERNARY = archetypal patterns

Source: Christopher Alexander *et al* (1977). Pattern Language: Towns, Buildings, Construction and partner to previous The Timeless Way of Building.

What is 'Pattern Language' & the timeless way of building?
"The elements of this language are entities called patterns. Each pattern describes a problem which occurs over and over again in our environment, and then describes the core solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice." Alexander *et al* (1977), pg. X

ARCHETYPES are used to solve recurrent problems in a satisfactory manner to suit human needs etc.→ the successes of vernacular architecture. Archetypes so called by Tom Turner about Christopher Alexander's (*et al*) Pattern Language.

The AIM of this sort of design: to achieve "the quality without a name" (i.e. a Taoist approach). The closest Alexander got to naming this quality was TIMELESS (after trying alive, whole, comfortable, free, exact, egoless & eternal). These patterns fall into 3 categories:

- SETTLEMENT ARCHETYPES
- BUILDING ARCHETYPES
- GARDEN ARCHETYPES

Comments from Turner...1996:24-28

- **ENEMIES of pattern language:** positivism & empiricism, capitalism & consumerism, individualism & totalitarianism, postmodernism & formalism, relativism & gigantism etc. i.e. political, epistemological, aesthetic & ideological enemies
- **FRIENDS of pattern language:** psychology & behavioural studies, ecology & landscape ecology, oral traditions (storytelling), geomorphological & growth patterns, visual & design patterns.

CAUTIONARY POINTS about PATTERN LANGUAGE:
Scientific method /positivism objects to the inability of Pattern Language type design to be "objectively quantifiable"
→ THUS,

- TREAT EACH PATTERN CRITICALLY
- ignore the proscriptive/absolutist tone
- scrutinise for aptness to local circumstances (especially climatic suitability ; e.g. #105 south-facing outdoors not sunny in southern hemisphere, but shade is what is needed in warmer climates.

THESE PATTERNS CONTAIN RELATIVE TRUTHS NOT ABSOLUTE TRUTHS

"I conceive that land belongs for use to a vast family of which many are dead, few are living, and countless members are still unborn. –– a Nigerian tribesman." [Alexander 1977:37].

"In a sense, at least a part of the language we have presented here, is the archetypal core of all possible pattern languages, which can make people feel alive and human." [Alexander 1977:xvii].

There are a total of 253 patterns that comprise Pattern Language. Here are a few selected examples of those ARCHETYPAL PATTERNS:

# 31	= Promenade	pg.168
# 59	= Quiet Backs	pg.301
# 61	= Small Public Squares	pg.310
# 106	= Positive Outdoor Space	pg.517
# 119	= Arcades	pg.580
# 121	= Path Shape	pg.589
# 176	= Garden Seat	pg.815

 # 31 = Promenade [Alexander 1977:168-173]

"Each subculture needs a center for its public life: a place where you can go to see people, and to be seen."
"encourage the gradual formation of a promenade at the heart of every community, linking the main activity nodes, and placed centrally, so that each point in the community is within 10 minutes' walk of it. Put main points of attraction at the two ends, to keep a constant movement up and down."

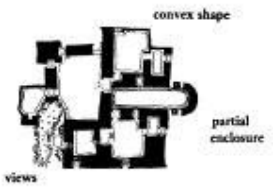
 # 59 = Quiet Backs [Alexander 1977:301-303]

"Any one who has to work in noise, in offices with people all around, needs to be able to pause and refresh [themselves] with quiet in a more natural situation"

 # 61 = Small Public Squares [Alexander 1977:310-314]

"A town needs public squares; they are the largest, most public rooms, that the town has. But when they are too large, they look and feel deserted."
→ usually 45-60 ft (15-20m) across and never more than 70 ft (c.24m) across – and longer in the other direction OK.

 # 106 = Positive Outdoor Space [Alexander 1977:517-523]



"Outdoor spaces which are merely 'left over' between buildings will, in general, not be used."
"Make all the outdoor spaces which surround and lie between your buildings positive. Give each one some degree of enclosure; surround each space with wings of buildings, trees, hedges, fences, arcades, and trellised walks, until it becomes an entity with a positive quality and does not spill out indefinitely around the corners."

 # 119 = Arcades [Alexander 1977: 580-584]

"Arcades – covered walkways at the edge of buildings, which are partly inside, partly outside – play a vital role in the way that people interact with buildings.

 # 121 = Path Shape [Alexander 1977: 589-592]

"Streets should be for staying in, and not just for moving through, the way they are today."
"Make a bulge in the middle of a public path, and make the ends narrower, so that the path forms an enclosure which is a place to stay, not just a place to pass through."

 # 176 = Garden Seat [Alexander 1977:815-817]

"Somewhere in every garden, there must be at least one spot, a quiet garden seat, in which a person – or two people – can reach into themselves and be in touch with nothing else but nature."

CONCLUSION about USES OF PATTERNS in design

- to analyse existing urban form (identify context)
- to recognise natural systems / flows
- to design in sympathy with existing physical contexts & processes (with surrounds or with environment)
- to inspire creativity (in designer & user!)
- to make places people enjoy (i.e. pleasurable, safe, exciting, familiar, unusual), etc.

"If you can't draw a diagram, it isn't a pattern. (Christopher Alexander)"
[Turner 1996:157].

PATTERN ASSISTED DESIGN (PAD)

Tom Turner's 4 kind of patterns...

- PRIMARY = natural
- SECONDARY = human
- TERTIARY = aesthetic
- QUATERNARY = archetypal

PAD approaches use these forms of patterns (singly or together) to help generate creative design solutions.

PAD is an addition to traditional design methods.

REFERENCES

Cooper, W. W. (1983), "The Figure/Grounds." Cornell Journal of Architecture. 3: pp. 42-53.

Turner, Tom (1996), City as Landscape, London: Spon.

Alexander, Christopher *et al* (1977), A Pattern Language: Towns, Buildings, Construction, New York: Oxford University Press

Mauduit, Caroline (1988). An Architect in Italy. New York: Clarkson N. Potter publishers.

Mann, William A. (1993). Landscape Architecture: an illustrated history in timelines, site plans, and biography. New York: John Wiley.

DESIGN #8

Drawing is a vital tool for creativity, and design thrives on creativity!

CREATIVITY, DRAWING and DESIGN

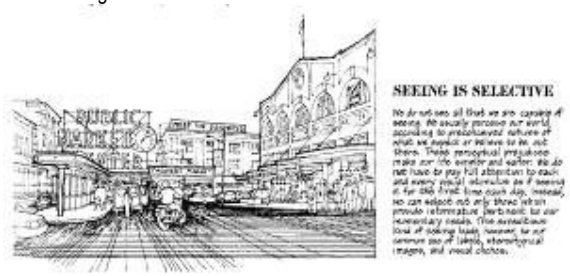
Francis D. K. Ching's book Drawing: a Creative Process (1990) is the basis of this section. He believes that a designer can generate CREATIVITY through DRAWING.
There are three main interactive aspects to this process:

- SEEING
- VISUALIZING
- EXPRESSING

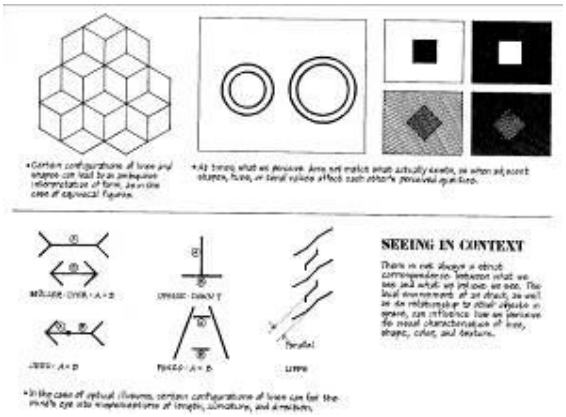
Other aspects include: ENVISIONING, which can be achieved through drawing from the IMAGINATION and drawing by EXPLORATION; and, SPECULATION – drawing and creativity.
"Fluency in drawing promotes the fluent generation of ideas." [Ching 1990:10]

CREATIVITY: *in drawing process*
SEEING = visual perception [Ching 1990:12-15]

- the primary sensory channel (eye to mind)
- seeing is selective → e.g. looking for the time of day; searching for a face in the crowd; watching for moving vehicles.
- seeing from different viewpoints (painter, botanist, designer...)
- seeing in context



[Ching 1990:13]



[Ching 1990:15]

VISUALIZING = processing of visual data
[Ching 1990: 16-19]

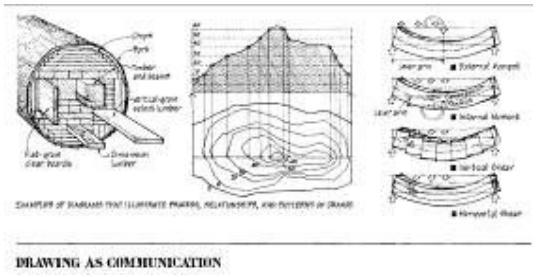
- mind searching data for structure & meaning
- seeing with the mind's eye (scan-hold-project-draw)
- drawing helps sharpen our perception of: proportion, structure, details...
- drawing from memory: "by encouraging attentive seeing, drawing reinforces visual memory"
- drawing beyond the present → possibilities and projections.

EXPRESSING = graphic representation of our perception & understanding
[Ching 1990: 20-21]

- combination of outer reality we see & inner imagery of mind's eye
- expressing shapes and forms, forms and spaces, density and texture, light and shade, movement and direction
- expressive qualities of lines – "The visual characteristics of a drawn line also have the power of suggestion."

Drawings as tools for...
[Ching 1990: 28-33]

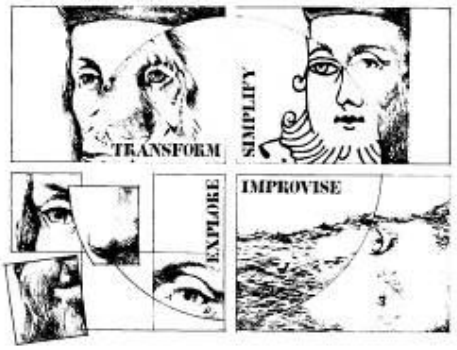
- REPRESENTATION
  (= realistic impressions of objects, scenes, etc.)
- VISUALIZATION
  (= how it works in action, exploratory drawings of possible concepts, etc.)
- COMMUNICATION
  (= to convey a message or information EXPLICITLY)



[Ching 1990:32]

ENVISIONING : *Drawing with Imagination*
drawing as a graphic means to visual thought using the mind's eye to:

- TRANSFORM
- SIMPLIFY (Perception: from concrete to abstract)
- IMPROVISE (Imagination: from the abstract to concrete)
- EXPLORE (Different types of drawing views and viewpoints)
- Thinking on paper [Ching 1990: 140-145]



[Ching 1990:183]

ENVISIONING : *Drawing by Exploration*
[Ching 1990: 182-183]
EXPLORATIVE DRAWINGS ARE INTERACTIVE ...
- searching for patterns and/or meanings
- manipulating elements (structures, proportion, components)
- creating the illusion of depth & movement

[Ching 1990:183]

CREATIVITY : *Speculation*
[Ching 1990: 184-198]
ASPECTS OF SPECULATION:
- trust in intuition
- multitude of possibilities
- take advantage of change
- be fluent ; be flexible ; tolerate ambiguity
- see in new ways
- make connections ; recognize patterns
- be selective

Speculation ~ *trust in intuition*
[Ching 1990:184]
- intuition is based on informed experience
- can be used as a guide to search for possibilities & to outline choices
- "a hunch is creativity trying to tell you something" (Frank Capra, film-maker)
- "doodling is brooding of the hand" (Saul Steinberg)

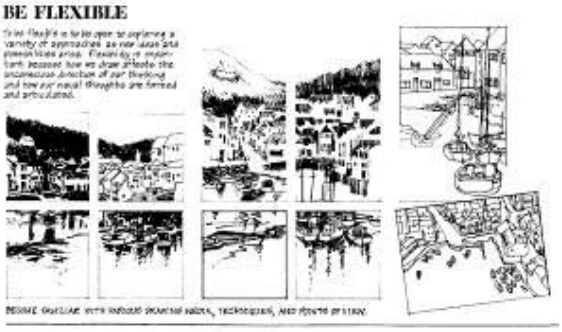
Speculation ~ *a multitude of possibilities*
[Ching 1990:184]
Accept worth of incomplete drawings within design process
- descriptive words to images
- collage of images
- collection of details
- plan views of horizontal relationships
- section views of vertical relationships
- structural patterns
- site and context

Speculation ~ *take advantage of change*
[Ching 1990:185]
- use first sketches like an outline for an essay → set down the essentials and work up from there
- sift out the important features, discard rest
- use the act of drawing out an idea as a stimulant for alternative strategies

Speculation ~ *be fluent*
[Ching 1990:186-7]
- generate wide range of possibilities/ ideas
- develop drawing ability to keep up with flow of thoughts
- first develop deliberate / accurate skills; speed without judgment is counter-productive
- speed comes with practice & repetition over time
- develop drawing efficiency
- what is needed, what to omit to communicate idea

See more in section GRAPHICS #8.

Speculation ~ *be flexible*
[Ching 1990:188-9]
- be open to exploring a variety of approaches → different drawing media, drawing techniques, points of view
- how we draw affects the unconscious direction of our thinking... be willing to ask, "what if ..."
- fluency & flexibility must be coupled with judgment & electivity

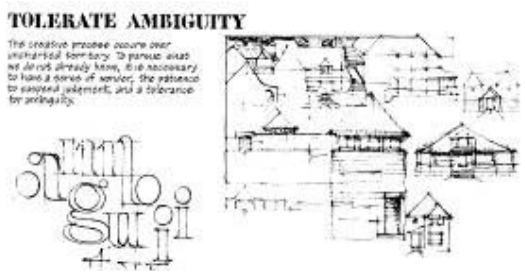


[Ching 1990:188]

Speculation ~ *tolerate ambiguity*
[Ching 1990:190-1]
While exploring unknown territory (creative process) you need to have ...
- a sense of wonder
- the patience to suspend judgment
- a tolerance of ambiguity

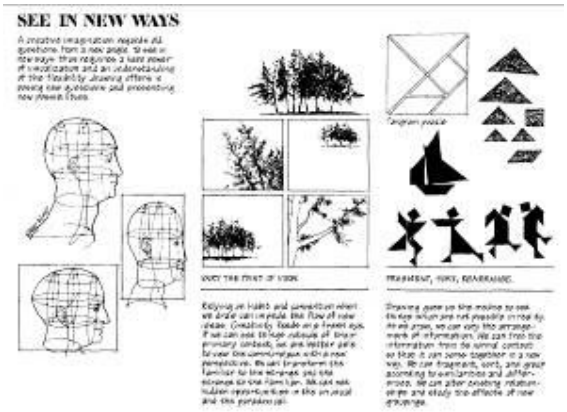
Exploratory drawings are open-ended and able to be adapted to developing needs

Be open to chance & discovery



[Ching 1990:190]

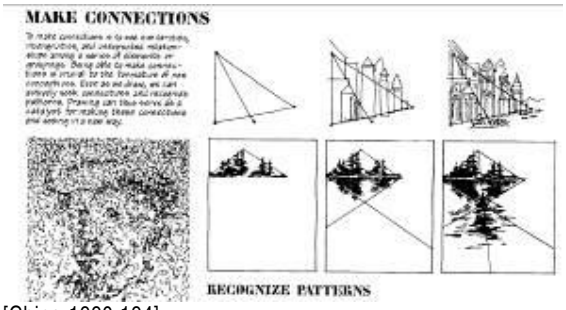
Speculation ~ *see in new ways*
[Ching 1990:192-3]
A creative imagination regards old questions from new angles:
- vary the point of view
- fragment, sort, rearrange
- work at various scales
- mirror images
- see inside things
- see the part and how it fits within the whole



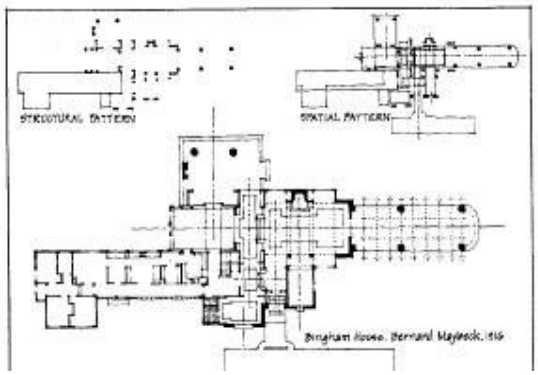
[Ching 1990:192]

Speculation ~ *make connections / recognise patterns*
[Ching 1990:194-5]

- making new connections crucial to forming new conceptions
- perceive the configurations of significant similarities & differences among elements
- several layers of patterns = several layers of meaning



[Ching 1990:194]



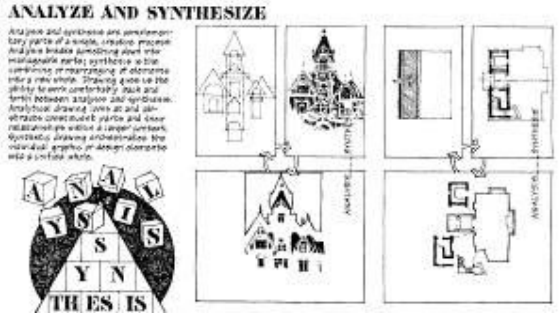
[Ching 1990:195]

"Drawing without thinking is a dead end."
[Ching 1990:199]

Speculation ~ *analysis and synthesis*
[Ching 1990:196-7]

- analysing – breaking things down into manageable parts
- synthesizing – combining or rearranging elements

Both are part of the creative process.



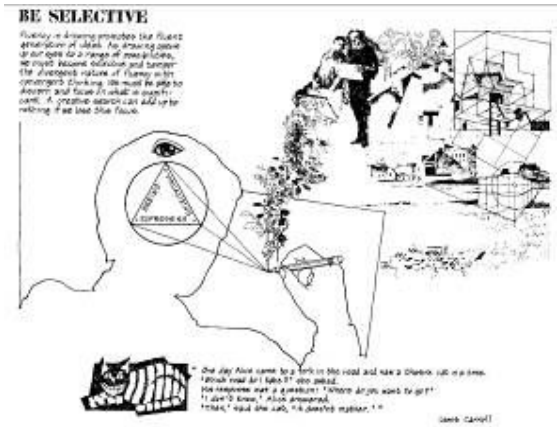
[Ching 1990:196]

TRANSFORMING a drawing by using tracing paper overlays for...

- Studying possible compositions
- Drawing oblique views
- trying out different formats
- combining parts in a new way

Speculation ~ *be selective*
[Ching 1990:198]

- "a creative search can add up to nothing if we lose the focus"
- after imagining, exploring, speculating ... be selective & temper the DIVERGENT thinking with CONVERGENT thinking to regain the focus
- Which brings us back to HOW TO DESIGN ...



[Ching 1990:198]

CREATIVE DRAWING REFERENCES:

CHING, FRANCIS D. K. (1990), Drawing: a Creative Process, New York: Van Nostrand Reinhold

SULLIVAN, CHIP (1995), Drawing the Landscape, New York: Van Nostrand Reinhold

DESIGN #9

Size DOES matter!!

ANTHROPOMETRY and ERGONOMICS for DESIGNERS

Designers must develop a sense of scale on many levels, for example: for functional reasons – to make things safe and comfortable for users and the environment; and, for aesthetic reasons – to achieve an appropriate proportion and visual character.

'ANTHROPOMETRY'
= the measurement of the size and proportion of the human body

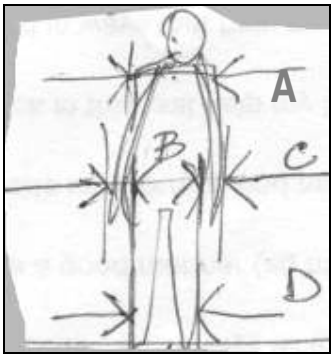
'ERGONOMICS'
= the study of the engineering aspects of the relationship between human workers and their working environment
[Macquarie Dictionary, 3rd edition]

WHAT IS THIS ALL ABOUT?
Designers need to know the SPACE REQUIREMENTS to design for:

- People (all sorts, sizes, genders, ages, abilities)
- Cars, buses, trucks and bicycles etc.
- Active sports and passive recreational pursuits etc.

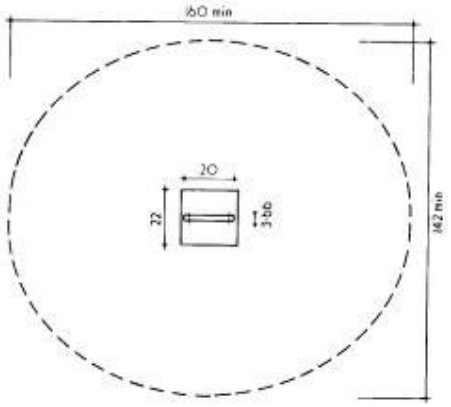
DESIGNERS DEVELOP ESTIMATING SKILLS AS PART OF THEIR DESIGN TOOLBOX.
E.g.

- How long is a metre?
- How long is 300mm, or 25mm?
- How wide is that door?
- How high is that ceiling or that tree?
- What is your ordinary walking gait?



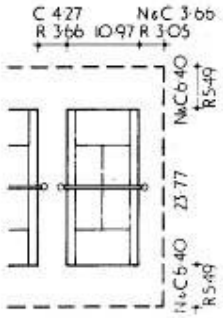
SPORTSFIELDS STANDARDS

CRICKET: 160m x 142 m minimum [Tutt 1990:222]



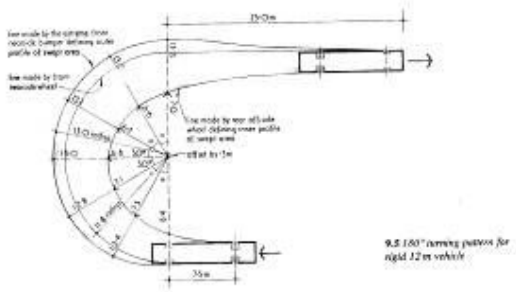
26.39 *Cricket. The centre square of about 22 m side is able to take the wickets in either direction. This is usually of special turf and grass species, and is roped off when not in use for playing. The outfield, on the other hand, is usually used for other field games (such as those in* **26.13** *to* **35***) when cricket is not played*

TENNIS [Tutt 1990:222]:



26.44 *Tennis, scale 1:1000. The surfaces of tennis courts may be grass, suitable asphalt or 'en-tout-cas'. The surrounds are of wire netting 3 to 4 m high*

VEHICULAR widths, lengths, turning-circles...



Tutt 1990:54
NB Local Governments (especially large ones) can provide the most up-to-date preferred carpark sizes and vehicular turning circles.

ANTHROPOMETRICS: Measuring people

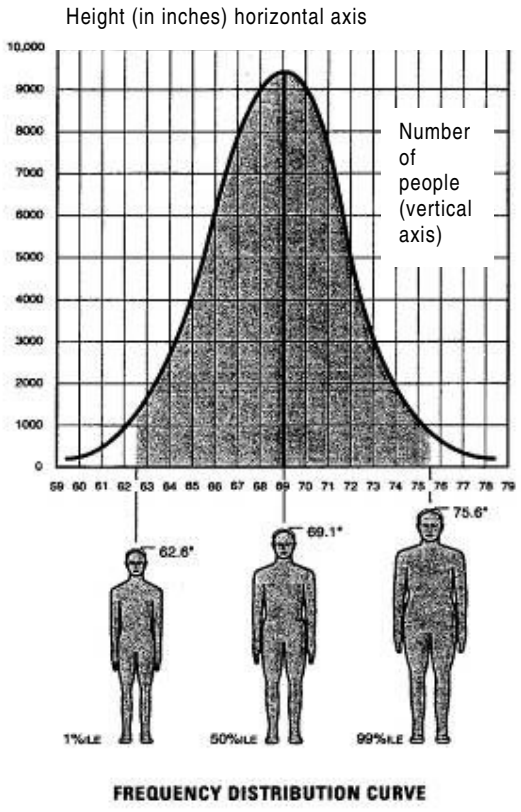
- What is the widest part of a person to help find a suitable width for a path (A, B, or C)?
- Does this alter when swinging arms and legs are taken into account?

← refer to image left

ANTHROPOMETRICS: percentiles

Designers consider the variation of sizes with populations:

- mean = average
- 5th percentile = smaller sizes
- 95th percentile = larger sizes



Dreyfuss 1993:11 (USA)

Calculating Percentiles

PERCENTILE	Included
99.9 = Mean + (3 x SD)	99.8 %
85 = Mean + (1.04 X SD)	70 %
75 = Mean + (0.67 X SD)	50 %
50 = Mean	
25 = Mean - (0.67 X SD)	50 %
10 = Mean - (1.28 X SD)	80 %
0.1 = Mean - (3 x SD)	99.8 %

Dreyfuss 1993:11

SD = Standard Deviation, which can be found by the formula:

$SD = \sqrt{(\sum(d)^2 \div N)}$, where,

$\sum$ = summation,

d = difference between one person's measurement and the arithmetic mean of that measurement

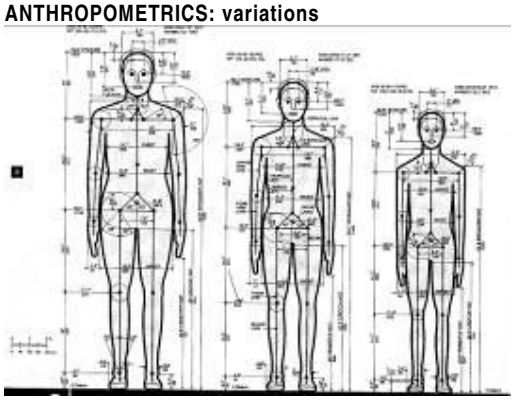
N = number of people in survey.

People are different in several ways. There are three main **categories of HUMAN VARIABILITY:**

- INTRA-INDIVIDUAL: sizes change during one's life due to aging, nutrition, damage...
  asymmetrical faces → why we dislike the camera's image (we are used to seeing ourselves in the mirror – the other way-around!)
- INTER-INDIVIDUAL: differences due to sex, ethnic and racial groups, also influenced by nutrition, medical problems, etc
-
- SECULAR VARIABILITY: the changes over generations due to nutritional & medical improvements or deprivations [typically outside the realm of the designer?]

SOURCE: Dreyfuss 1993:11

ANTHROPOMETRICS: variations

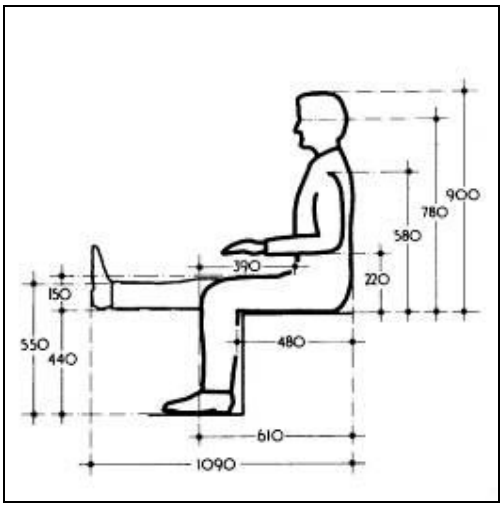


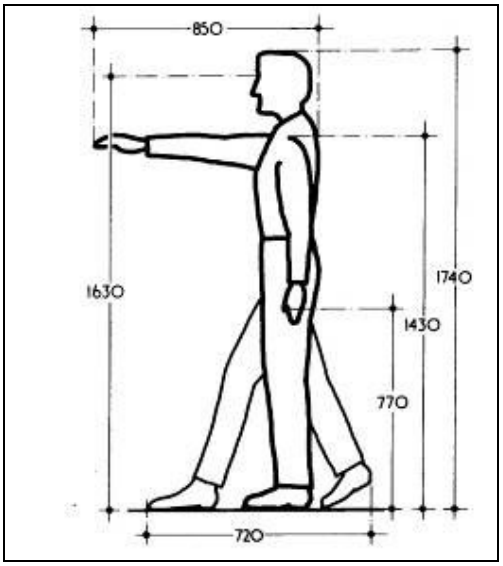
Dreyfuss 1993:22

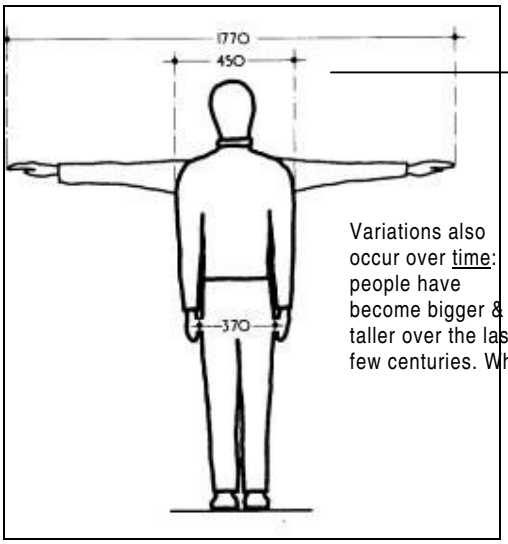
99 percentile MAN = 1920mm height
50 percentile MAN = 1755mm height
1 percentile MAN = 1590mm height

Remember: refer to texts at end of this section for more data on standard sizes of people and activities.

ANTHROPOMETRICS: 50th percentile British MALE
(1970s)



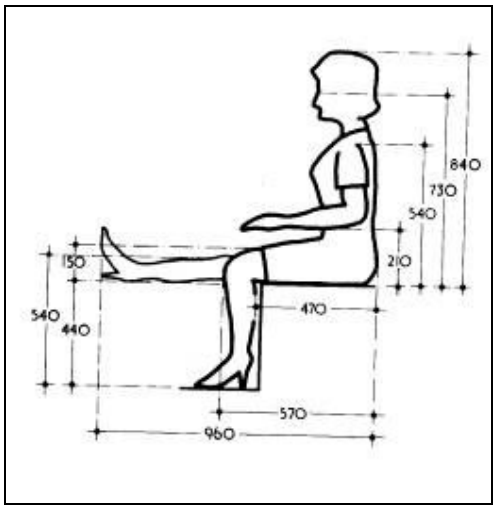


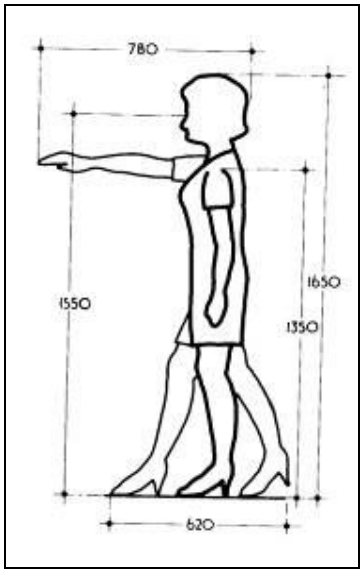


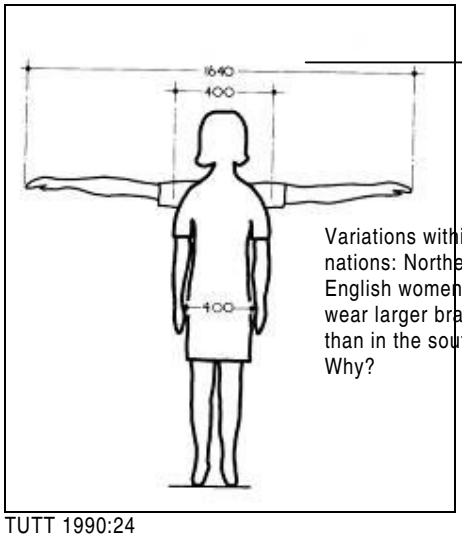
Variations also occur over <u>time</u>: people have become bigger & taller over the last few centuries. Why?

TUTT 1990:23

ANTHROPOMETRICS: 50th percentile British FEMALE
(1970s)



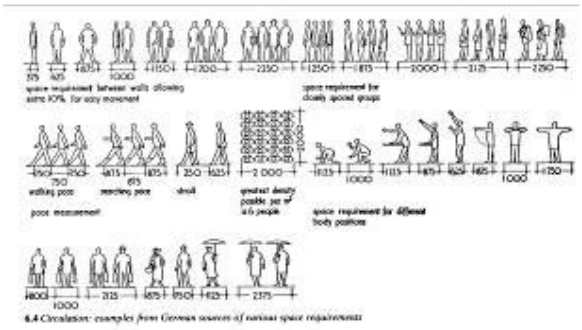




Variations within nations: Northern English women wear larger bras than in the south! Why?

TUTT 1990:24

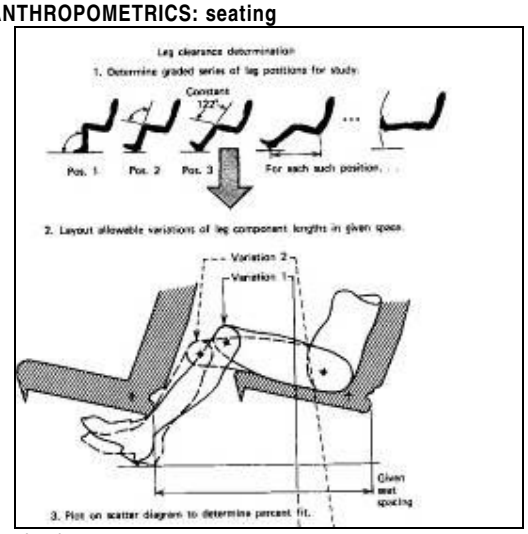
ANTHROPOMETRICS: groups of people



TUTT 1990:30 Citing German sources.

ROUNDING UP to multiples of 300mm: based on standard MATERIALS sizes

ANTHROPOMETRICS: seating



Roebuck 1993:121
NB: USA researched for NASA → they use 99%ile to accommodate big men!

'ERGONOMICS'

If ergonomics is the study of the engineering aspects of the relationship between human workers and their working environment – then we need to know the basics as ordinary people and as designers.

ERGONOMICS: e.g. lifting correctly #1

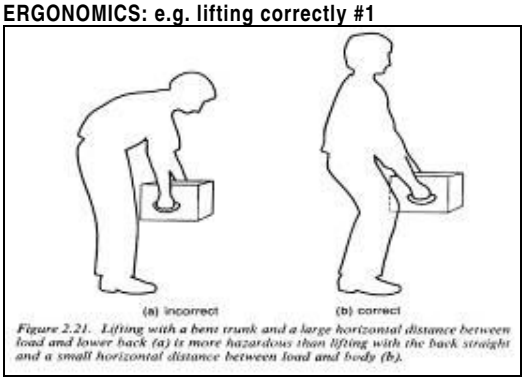


Figure 2.21. Lifting with a bent trunk and a large horizontal distance between load and lower back (a) is more hazardous than lifting with the back straight and a small horizontal distance between load and body (b).

Dul & Weerdmeester 1993:33. If the load is 20kg, then, (a) has 30% MORE back stress than (b), → OUCH!

ERGONOMICS: e.g. lifting correctly #2

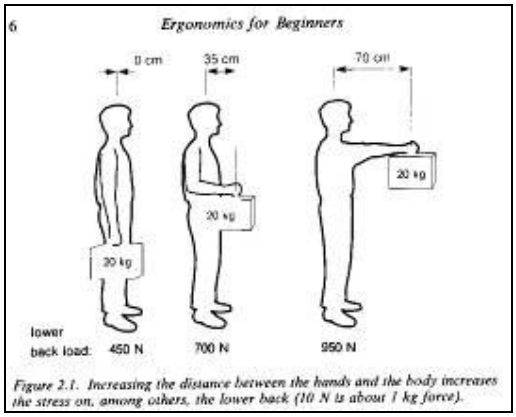
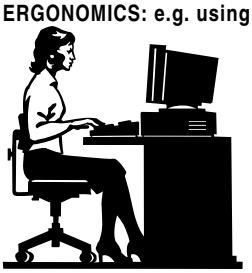


Figure 2.1. Increasing the distance between the hands and the body increases the stress on, among others, the lower back (10 N is about 1 kg force).

Dul & Weerdmeester 1993:6

ERGONOMICS: e.g. using your desk properly!

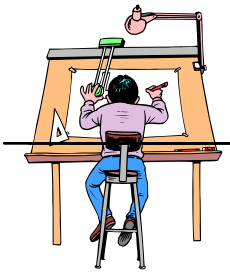


CORRECT HEIGHTS matter! e.g. of the chair, desk, keyboard, monitor, etc.

OUCH!

OUCH!

POSTURE matters!
Protecting your back for the long term! (Both these positions are both BAD for your back!)



GOOD LIGHTING matters! Get the correct intensity and appropriate direction → if you are right-handed, ~~then ensure light comes~~ from the left (thus avoiding shadows cast by your own hand, etc.

NO!

YES!

DANGER matters! Never use a 4 roller chair (they overturn easily); 5 rollers is the way to go!

GOOD SIGNAGE (part of ergonomics too)
SIGNAGE MUST BE LEGIBLE!

- Clear letters
- Sufficient contrast (lettering to background)
- Clear language (simple AND accurate)
- Sensibly located in space (unobscured, related to subject referring to, etc.)

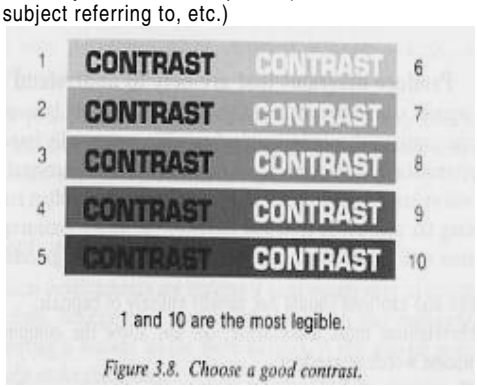


Figure 3.8. Choose a good contrast.

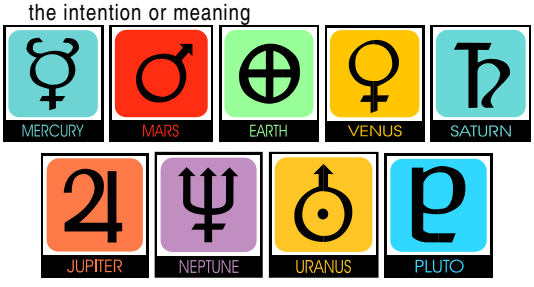
Dul & Weerdmeester 1993:47

VITAL SIGNAGE really must be legible!

3rd level A BLOCK, QUT/GP

AVOID MISLEADING SIGNAGE
Signs are used everywhere and they should be well designed to be effective.

- many sorts of signs rely on the reader being able to understand the particular language (e.g. English, mathematics, abbreviations or symbols) to understand the intention or meaning

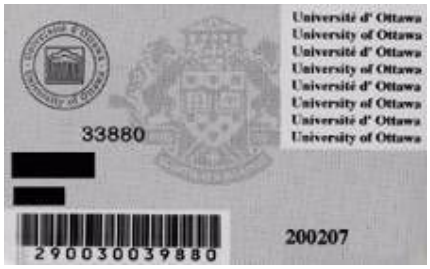


e.g. astronomical symbols for planets in our Solar System.

e.g. Standard (universal) signs and symbols.

- Be careful about specific directions and double meanings

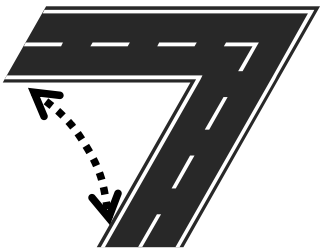
POOR SIGNAGE DESIGN UPDATE
Check out this website…
http://www.baddesigns.com/dorothy.html
e.g. Which is the student's ID number?



"Photographic image courtesy of www.baddesigns.com". The Bad Designs Web site can be referenced as "Darnell, M. J. Bad Human Factors Designs, www.baddesigns.com, 2000".

WEAR & TEAR as indicators of poor design
REMINDER – people prefer to walk the shortest distance between 2 points: e.g.

- Wear lines at path intersections and corners indicate 'cutting the corner' movements



- Wear lines across grassed areas indicate preferred pathways

Photographic images courtesy of www.baddesigns.com
The Bad Designs Web site can be referenced as "Darnell, M. J. Bad Human Factors Designs, www.baddesigns.com, 2000".

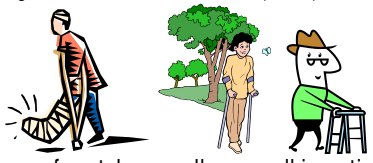
WEAR & TEAR: on walls & furniture

E.g. room A311 in A block, GP at QUT.
Another indicator of poor design...
Rubbing/dirty marks on walls/posts denote wear by people or furniture or both
Solution → dado lines and skirting boards do more than just cover joins!

BARRIER-FREE DESIGN
= good design (UNIVERSAL DESIGN)

- Temporary impairments – typically just mobility...
- Permanent impairments – mobility, seeing, hearing, manual dexterity
- Partial and Total impairments

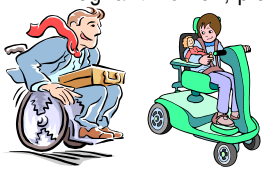
See Challenges matrix from Robinette (1985) on next page.



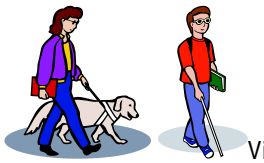
Users of crutches, walkers, walking sticks

Older folk and children

Pregnant women; plump /tall /short people



Wheelies (all sorts)



Vision impaired

Hearing impaired

DESIGNERS MUST BE INCLUSIVE !
Users of public spaces include all sorts of people (size, gender, age, ability) – with varying needs.

CHALLENGES MATRIX
Table of Handicap / Site Element Relationship

PHYSICAL LIMITATION	Temporary	Mobility (a)	(b) wheelchair	(b) crutches	(b) cane	(b) walker	Manual (Partial0	Manual (Total)	Audio (Partial)	Audio (Total)	Visual (Partial)	Visual (Total)	Activity
SITE ELEMENTS													
Paving surfaces	■	■	■	■	■	■						■	■
Natural surfaces	■	■	■	■	■	■						■	■
Kerbs	■	■	■	■	■	■					■	■	
Drainage	■		■	■	■	■					■	■	
Grades	■		■	■	■	■					■	■	
Intersections	■		■	■	■	■			■	■	■	■	
Ramps	■	■	■	■	■	■	■	■			■	■	■
Stairs	■	■	■	■	■		■	■			■	■	■
Handrails	■	■	■		■		■	■			■	■	■
Gates	■	■	■	■	■	■	■	■					■
Railings	■	■	■	■	■	■	■	■				■	
Waiting Areas	■	■	■	■	■	■							
Drop-off zones	■		■	■	■	■							
Parking areas	■		■	■	■	■							
Planting	■		■	■	■	■							
Lighting	■		■								■		
Signage	■		■								■	■	
Playgrounds	■	■	■	■	■	■	■	■					■
Camping	■	■	■	■	■	■							■
Picnicking	■	■	■	■	■	■							■
Interpret. Trails	■	■	■	■	■	■					■	■	■
Spectator areas	■	■	■	■	■	■							■
Fishing	■	■	■	■	■	■	■						■
Boating	■	■	■	■	■	■	■	■					■
Swimming	■	■	■	■	■	■	■	■					■
Seating	■	■	■	■	■	■		■					■
Tables	■		■	■									■
Public Phones	■		■	■		■	■	■	■				■
Drink. Fountains	■		■	■	■	■	■	■					■
Trash bins	■		■	■	■	■	■	■					■

Adapted from Robinette, 1985:19.

ANTHROPOMETRIC REFERENCES

Check out Lecturer Andrew Scott's excellent resource materials listed ONLINE for ADB212 Ergonomics for Industrial Designers (here at QUT)

Tandy, Cliff ed. (1984 or later), Handbook of Urban Design, London: Architectural Press.

Tutt, Patricia and David Adler eds.(1979), New Metric Handbook, London: Architectural Press.

Neufert, Ernest (1988), Architects' Data, Oxford : BSP Professional.

Henry Dreyfuss Associates (1993), The Measure of Man and Woman: Human Factors in Design, Whitney Library of Design series, New York: Watson/Guptill.

Henry Dreyfuss Associates (1991), Humanscale 7/8/9 Manual, Cambridge, MA: MIT Press.

Dul, J. and B. Weerdmester (1998), Ergonomics for Beginners: A Quick Reference Guide, London: Taylor & Francis.

Robinette, Gary O. (1985), Barrier-free Exterior Design: anyone can go anywhere, New York: Van Nostrand Reinhold.

DESIGN #10

Finding the successes & failures in design is vital if you are to improve your design skills!

Post Occupancy Evaluation (POE)

The new building and its surroundings are complete; the users have taken up residence and operations are underway. The design receives a reward or two from the RAIA, AILA and even the lighting engineers. But how does the complex really work? Are the users and the owners pleased with the result? How do you find out if a design in the built environment is effective and who does this evaluation? This essay discusses these questions and more.

The often-neglected stage in the design process is that of evaluating the success or failure of a designed product. This not limited to architecture or interior design; it is a common failing across the built environment disciplines. The POE provides necessary feedback to improve the next design project and correct problems found in already completed works. Unfortunately, it is seldom budgeted for and frequently the only indications of the need for a POE comes from the large number of items on a defects schedule (seen as the builder's problem) and subsequent maintenance problems (seen as the owner's problem), and occasionally a law suit (seen as everyone's problem – designers, builders and owners).

Post occupancy evaluations combine techniques from several social science disciplines (e.g. environmental psychology and sociology) and from good design practice. The personal undertaking POEs can include specialist or generalist consultants such as environmental psychologists, landscape architects, architects, construction managers and others. The process of undertaking a POE resembles the logical step-by-step process of the traditional design method, and is fundamentally:
Data collection → analysing data → presenting findings.
However, in true scientific mode, before the real data can be collected, the researcher needs to determine the appropriate research technique/s, the limitations of their research (time, resources, area to be studied, etc.) and thus develop their real research goals.

The typical measuring stick in this analytical operation is the original brief to the designer; what were the objectives and goals of the intended design? By comparing these performance objectives with the perceived outcomes of the design, one can begin to ascertain the effectiveness of the design. However, there may be other factors that should be considered: Were the original objectives appropriate? Has the context or other circumstances changed the relevance of these objectives? For instance, the effectiveness of Nazi concentration camps at achieving "the final solution" (the elimination of perceived undesirable elements in society: Jews, gypsies, homosexuals and communists) could be argued to be relatively successful. Fortunately, their ultimate success was not achieved, but the processes of mass-genocide did become more and more efficient.

The fundamental flaw in this process was in desiring to undertake such gruesome and inhumane ideas in the first place. Thus, whatever the original objectives of a design project, the context of ethics, lawfulness and social responsibility also should be taken into account. "Just following orders" is not a reasonable excuse for bad behaviour or bad design.

The benefits of POEs include:
- human benefits – by helping to make environments more humane, appropriate, equitable, accessible, enjoyable, safe and responsive
- professional benefits – by reducing legal problems, increasing the excellence of design products (and so improve the reputations of designers), and helping practitioners to make informed decisions.

(Based on Preiser 1988:38).

Crime Prevention Through Environmental Design (CPTED, pronounced sep-ted) is a recent additional factor in achieving good design. It is believed that proper design and effective (legimiate) use of the built environment can lead to reductions in the incidence of crime and of fear among users, and ultimately create an improved quality of life. Normally, these ideas are applied at the beginning of the design stage and continue through implementation, because 'retrofitting' can become very expensive. However, POE should also assess the effectiveness of CPTED in the completed designed place.

Research Methods
Lynch and Hack (1998) list these data gathering research techniques in their chapter "The User"; they are suitable for fuelling the analysis of existing sites before design change occurs and for POE.
These techniques include:

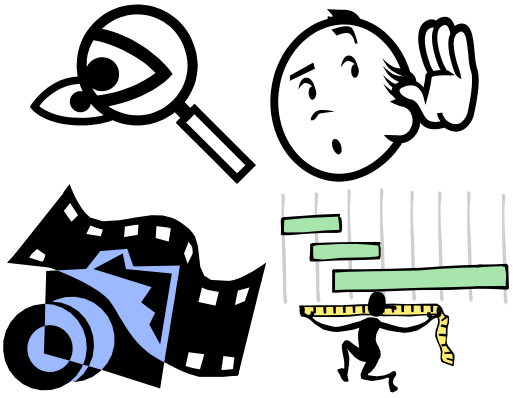
Indirect observation	Behaviour circuits	Forced choice
Past choices	Selected behaviour	Memories
Precedents	Experiments	Predictions
Archives	Direct communication	Empathy
Content analysis	Interviews	Site visits
Traces	Activity logs	Group interviews
Formal studies	Naming problems	Participant observation
Direct observation	Images	Self-observation
Behaviour settings	Preferences	
Movements patterns	Semantic differential	

In environmental psychology, Gifford (1997:12) provides 2 lists of research techniques:
STANDARD SOCIAL SCIENCES TECHNIQUES:
- Naturalistic observation and description
- Interviews
- Rating scales
- Laboratory experiments
- videotaping

and OTHER TECHNIQUES UNIQUE TO ENVIRONMENTAL PSYCHOLOGY:
- personal space studies
- cognitive maps
- movement through buildings/spaces

Another list of ways of RECORDING USE AND MOVEMENT THROUGH SPACE includes:

- Mapping (using lines = visitor routes)
- Videotaping
- Slow motion photography
- Stop-gap photography
- Counting people – both incoming and outgoing
- Activity descriptions (written, or draw 'shorthand' icon, or stickers, etc.)
- Behavioural traces = find wear lines on fabric (through grass, grubby marks on walls, etc.)



Placing such record data into context is vital. Thus, the research should include finding out basic data on the existing physical character of the place being studied, local climate, safety conditions, current maintenance regimes, type and extent of facilities, the character of surrounding buildings/open spaces and adjacent activities, etc. Consideration of activities within the study area at different times of the day, week, month, and during different seasons is equally important to gaining a well-rounded story about the place. Background data on users (profiles) should include gathering information on gender, age, discipline/education, and origin (workplace, residence, or birthplace, depending on the situation under study).

Analysis of Data for POE and presentation of results

Different data gathering techniques require different analytical approaches. Some approaches are graphic and subjective; some are quantifiable and can be tabulated or qualitative and thus have to be described. Normally, a combination of techniques is used. Some other ways of presenting quantitative data include bar charts, tables, pie diagrams and graphs. The use of computer software in these circumstances is well worthwhile. Maps and plans and similar diagrams can provide necessary spatial information and context. Poems and mental maps can provide a concise précis of qualitative interpretations. Depending on each site and its character, the major findings about users could include: the types of activities undertaken; their frequency and extent of use; feedback about levels of comfort and safety; and, other subjective responses about the place – feelings towards and desires about the place.

In summary, a POE should be able to identify the major problems and perhaps suggest courses of action to correct these problems, and identify the strengths and successes about the place.

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Marcus, C.C. and C. Francis (eds) (1990), People Places: Design Guidelines for Urban Open Space. Van Nostrand Reinhold: NY.

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Preiser, W.F.E. *et al* (1980), "A Post–Occupancy Evaluation of the Wentworth Building", University of Sydney, NSW.

Whyte, William (1980), The Social Life In Small Urban Spaces. Conservation Foundation: Washington D.C.

CPTED sources:

International Security Management & Crime Prevention Institute: http://www.cpted.com.au/home.html

International CPTED Association (ICA): http://www.cpted.net/home.html

Unpublished BBE/QUT student project reports from PSB462 Conservation and Management (2001):

"Post-Occupancy Evaluation of X & Y Courtyard,"

"Post-Occupancy Evaluation of V Block Podium," Christopher, Villian *et al.*

"Post-Occupancy Evaluation of D Block Yard,"

DESIGN #11

Where are you going? How?

What are you doing? Why?

Vision Statements, Goals & Objectives

In your design studios, lecturers and tutors will be asking for a clear description (demonstrating a understanding by you) of your design goals, objectives or similar terms. Always check with your lecturer what they mean by these terms. Here is a preliminary attempt to grasp what we are talking about.

Vision Statements

These are used in landscape design and planning schemes as 'mood' setters to the proposed designs...e.g. ...to enrich the economic diversity of the local community...
POTENTIAL PITFALLS:

- being to vague ('motherhood' statements)
- using voguish language (alienates the public)
- being pretentious (alienates everybody)...

DEFINITION: design GOALS & objectives
GOALS (broad & general statements), supplemented by...

OBJECTIVES (fuller detailed statements, describing what must be attained in order to achieve goals)
[Source: McLoughlin 1970:106-109]

You can use objectives to test whether a project is successful or not... i.e. performance criteria...

Some types of goals in 'physical planning':

- AESTHETIC QUALITIES
  e.g. Ancient Greece, Renaissance & Baroque Eras, City Beautiful Movement (19th-20th centuries)
- HEALTHY & SANITARY LIVING CONDITIONS
  especially important since 19th century
- ECONOMIC HEALTH
  linked with growth, global economy issues etc.
- ACCESSIBILITY
  opportunity for interaction [& for the disadvantaged!]
- COMPREHENSIVENESS
  striving for total welfare of a community, rather than partial [health] or sectorial [the wealthy] interests alone.

Who formulates goals?
In physical planning, goals & objectives require dialogue between 'professionals' and 'politicians'

- where professionals include planners and other advisers (medicos, engineers, architects, lawyers, teachers, welfare professionals, etc.),
- and politicians include those elected representatives and other groups (trade unions, management associations, churches, neighbourhood associations, welfare groups, minority groups, etc.)

[Source: McLoughlin 1970:120-121]

Systems approach to planning
"Under the systems concept, planning occurs at three different levels:
(1) master planning for the establishment of goals, objectives, and broad policies
(2) resource-allocation planning for the project and facilitating systems
(3) operations planning for each of the planning systems... A substantial part of planning involves discovering and defining problem areas... "

There are many variables in MASTER PLANNING, which means the process is unstructured and requires imagination and creative thinking to succeed.
[See McLoughlin 1970:124]

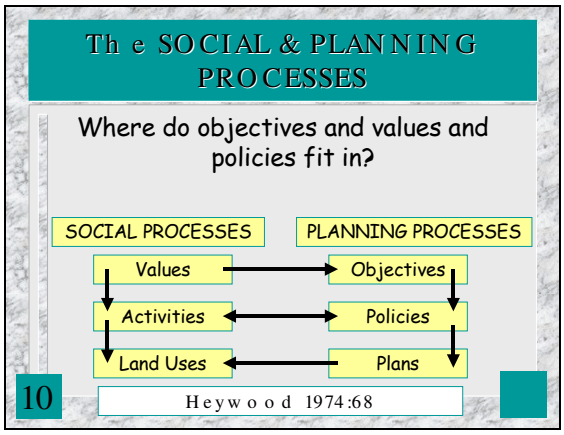
WHY objectives are needed
"In simplest terms physical planning is an attempt to satisfy human and social aims by providing appropriate and well places buildings and facilities."

"The failings of intuitive planning are twofold. First, even the greatest and most humane thinker cannot accurately sense the precise problems and priorities of his fellow citizens. Second, the conviction that these is only one particular way of satisfying these wants is unlikely to be right." [Source: Heywood 1974:52]

Ways of discovering objectives
In WESTERN SOCIETIES... there exists

- advanced educational systems
- freedom of speech
- advanced/widespread communication technology
- formal democratic structure

THUS, by lobbying, by polling, by seeking opinions, by informing & consulting with community... objectives can be prepared. [Source: Heywood 1974:53]



SUMMARY DEFINITIONS:
by Glenn THOMAS

Associate Professor (Landscape Architecture) at QUT:
[Pers. com. 24/1/2000]
"**VISION**
– the stars you are trying to reach & they to be far enough away to make you stretch for them.

GOAL (or AIM)
– the star you definitely want to get your hands on to have a sense of achievement at the end

OBJECTIVES
– the (dare I say it?) generic steps you need to take to (a) reach the target star and (b) provide you with the performance measures that demonstrate you have reached your goal (or achieved your aim). I have used *generic* because there is a temptation to include preconceived solutions as objectives and this is cheating. There is also a much needed discipline to devise objectives that are achievable and are measurable."

OBJECTIVES REFERENCES

Chapter 4, "What Values? Whose Objectives",
In Heywood, Phil (1974), Planning and Human Need, New York: Praeger.

Chapter 6, "Goal Formulation: Identifying Objectives", In McLoughlin, J. Brian (1970), Urban and Regional Planning: a systems approach, London: Faber.

Both Books are in the QUT/GP Library

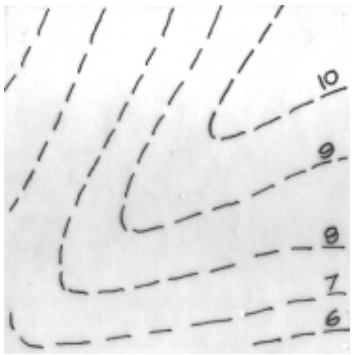
DESIGN #12

Understanding the three-dimensional character of land (topography) is vital for landscape designers.

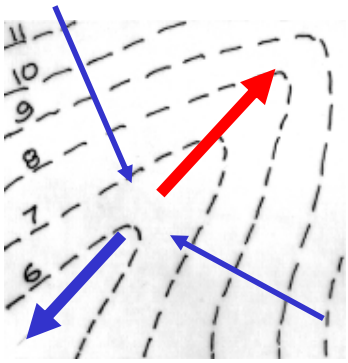
BASIC LANDFORMS

An essential skill for the landscape architect is the ability to read contour plans and maps to interpret landforms, which in turn is fundamental to designing (modifying or creating) new landforms. There are six basic landforms: ridges, valleys, knolls (or summits), concave slopes, convex slopes and depressions.

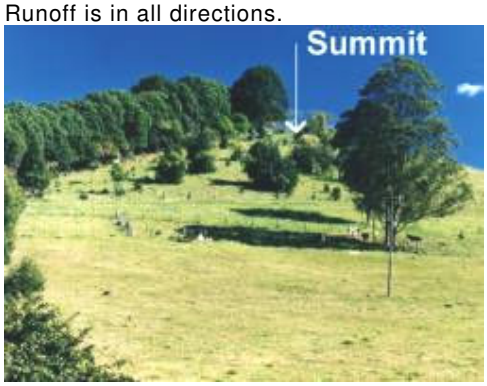
RIDGES: Ridges separate runoff in two directions and therefore are primary determinants of catchments. Descending contours point downhill on ridges.

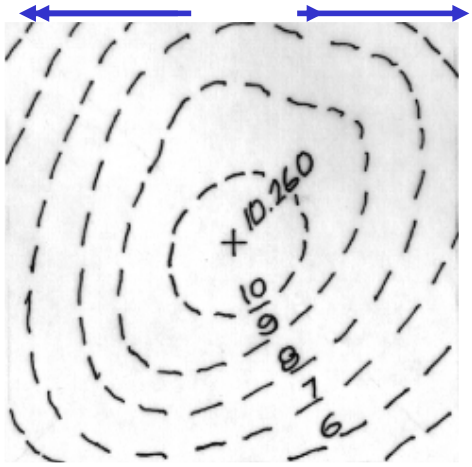


VALLEYS:
Valleys concentrate runoff from side slopes and direct the flow towards creeks and rivers. Ascending contours point uphill.

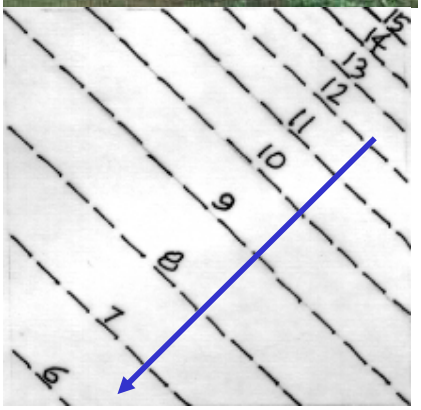


KNOLLS or SUMMITS: Enclosing contours ascend to a high point identified by a spot level or altitude. Runoff is in all directions.

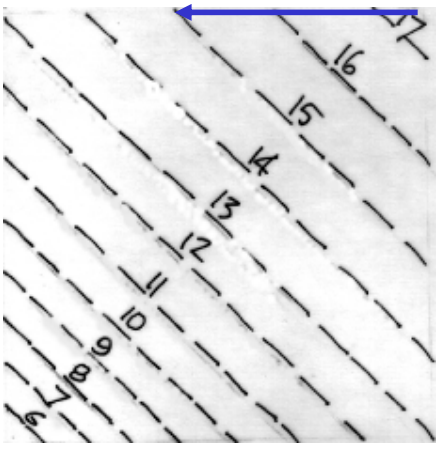




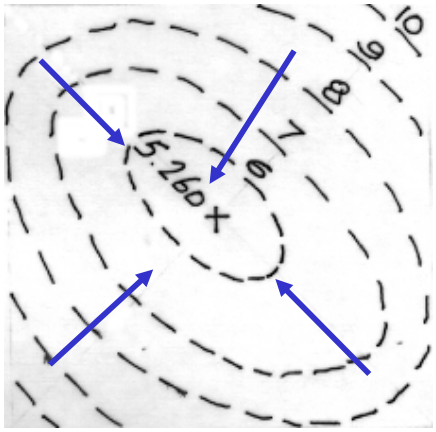
CONCAVE SLOPES:
Normally located in the lower slopes of hilly landforms. The ascending contours become more closely spaced as the gradient increases.
Runoff is at right angles to the contours



CONVEX SLOPES:
Normally located in the upper slopes of hilly landforms. The ascending contours become more widely spaced as the gradient decreases. Runoff is at right angles to the contours



DEPRESSIONS:
Enclosing contours descend to a low point identified by a spot level or altitude.
Runoff is into in the depression in all directions.



FUTURE STUDY:
More detailed understanding of landform will be covered in the GRADING module of DLB430 'Landscape Construction 1 unit.

DESIGN #13

EFFECTIVE DESIGN relies on good resource management: time, materials, information, people, etc.

STUDIO CRAFT

The following lists are the wise work of British landscape architecture teacher and writer Tom Turner.

SUMMARY of TOPICS
- WORKING PRINCIPLES OF DESIGN
- WHEN YOU GET STUCK IN A DESIGN!
- SPECIAL TYPES OF DESIGN: landform, surface water, planting, construction
- TYPES OF PRESENTATION
- WAYS TO RUIN A PROJECT!

7 Design Working Principles
(1) 'Consult the Genius of the Place'
= first law of landscape planning & design.
(2) Make places that are good from as many points of view as possible:
e.g. social, functional, artistic, spiritual, economic, climatic, hydrological, ecological, etc.
(3) Work with your clients.
(4) Proceed good design with good planning.
(5) Design SPACE before MASS.
(6) Use materials only of the best quality.
(7) Learn from the work of painters, sculptors, architects, poets, musicians, philosophers, novelists, etc
[Turner 1996:172]

12 things to try if you get stuck ...
(1) Turn the page upside-down!
(2) Switch to a different drawing!
(3) Use light upon dark!
(4) Use process instead of product!
(5) Start from a different base!
(6) Stop drawing and make a model!
(7) Take Humphry Repton's advice:
'make the plan on the spot'!
(8) Take Geoffrey Jellicoe's advice:
'look somewhere else – art books, TV...'!
(9) Take Mies van der Rohe's advice:
'God is in the details'!
(10) Postcarding: draw at tiny scale to fit on postcard!
(11) Assemble a brainstorming group!
(12) Soothe mind by soothing body:
garden, walk, yoga, bath! [Turner 1996:172-4]

Special Types of Detail Design *Landform Design*
3 ways of understanding / designing landform:
- by drawing contour lines & sections [2D]
- by clay (or other material) modelling [3D]
- by computer modelling [2D & 3D]

[Turner 1996:166-167]

Special Types of Detail Design *Surface Water Design*
- Surface water = about drainage
- water runs downhill !
"All outdoor surfaces must be laid to falls."
- waterproof surfaces (stone/concrete paving in British/Australian public parks)
- absorbent surfaces (e.g. mulched garden beds, gravel paving in French public parks)

→ SUSTAINABLE DESIGN = retain & reuse, don't waste it!
[Turner 1996:167-8]

Special Types of Detail Design *Planting Design*
Planting Design is not just a planting layout plan...
Planting Strategies = design objectives + planting techniques + management tasks.
Key Questions:
- What do you wish to achieve?
- How do you intend to achieve objectives?
- How will the planting change in time?
- What management operations are you committing the client to? [Turner 1996:166-7]

Special Types of Detail Design *Construction Design*
How to learn about it...
- look at built examples of good design
- build things yourself
- talk to & watch craftworkers work
- study trade catalogues, journals & books
- listen to lectures on construction!

[Turner 1996:169]

Some Types of Presentation
- EXISTING SITE DRAWING
- APPRAISAL / ANALYSIS DRAWING
(what's good & bad about site; but AVOID the 'battle plan' look !)
- CONCEPT SHEETS: circulation + spatial + landform + land + use + design + materials
- IMAGE SHEETS
(visual images of design, especially of archetypes)
- PHOTOMONTAGE
- COLLAGE
- MODELS, etc.. [Turner 1996:161-6]

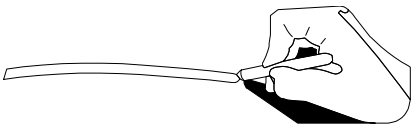
13 ways to RUIN a project !

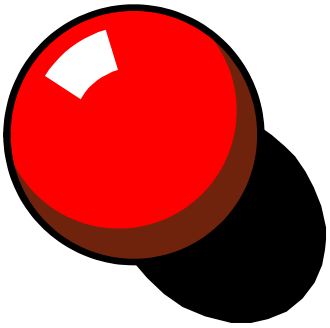
(1) Only nerds waste time reading studio programs: always get others to tell what is required!
(2) Wait a few weeks before starting work...
(3) Draw / work as little as possible in studio...
(4) Try to complete the design before looking at site or relief map...
(5) Be a perfectionist: don't draw a line until you are sure, avoid paper waste...
(6) Avoid scales, north points, cross-sections, contours...
(7) Keep nose close to drawing board – never look at work from distance
(8) Leave presentation work until the last minute...
(9) Keep the same drawing line weight through-out...
(10) If labelling MUST be done – choose an obscure, hard to read type-face
(11) In oral presentations, apologise for poor standard of work, mumble, avoid eye contact, ramble & say 'um' a lot...
(12) Never pay attention to what tutors say...
(13) Always remember that 'maestro' designers don't worry about costs, clients, practicalities, the health of the environment, etc. [Turner 1996:174-5

Finally...

- Use these notes for reference – now & forever!!
- watch out for (& AVOID) the classic errors in designing & presenting !
- try out some innovative presentation techniques !

Remember, PRACTICE MAKES PERFECT!





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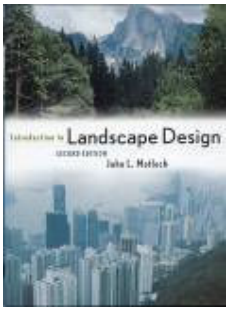

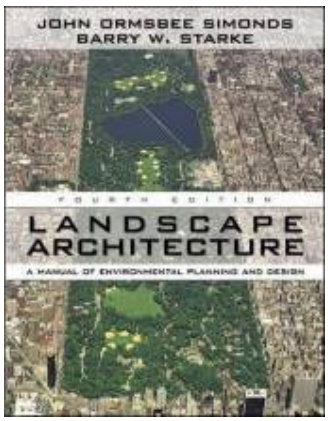

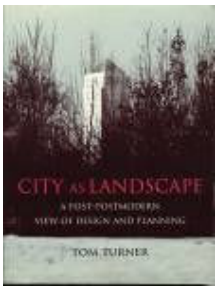

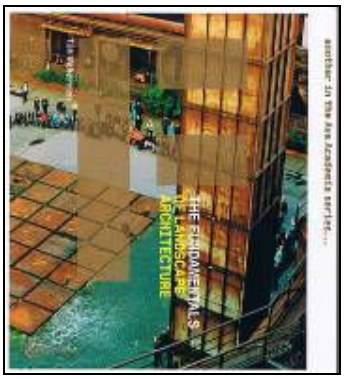

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CONTENTS

Chapter 7: Temporal Aspects of Perception
7.1 Temporal Aspects of Landscape
7.2 Space-Time Relationships
7.3 Cultural Attitudes Concerning Time
7.4 Temporal Frame of Reference
7.5 Time, Technology, and Economics
7.6 Time and Perception
7.7 Time and Distance
7.8 Movement and Perception
7.9 Temporal Paradox
7.10 Design as an Expression of Time
7.11 Design ad Response to Rate of Movement
7.12 Design and Rate of Change
7.13 Design as Temporal Networks
7.14 Temporal Aspects of Design Processes

Chapter 8: Visual Arts as Ordering Mechanism
8.1 Elements of Visual Form
8.2 Principles of Visual Form
8.3 Design Intent

Chapter 9: Geometry as Ordering Mechanism
9.1 Euclidean Geometry
9.2 Geometry in Nature

Chapter 10: Circulation as Ordering Mechanism
10.1 Pedestrian Circulation
10.2 Truck and Automobile Circulation
10.3 Bus Transit
10.4 Rail Transport
10.5 Air and Water Transport

Chapter 11:Spatial Development
11.1 Spatial Perception
11.2 Sense of Place
11.3 Spatial Design

Chapter 12: Architecture and Site Development
12.1 Site Design Intent
12.2 Architectural Morphology
12.3 Built-Site Synergisms

Chapter 13: Placemaking and Community-Building
13.1 Place Perception
13.2 Placemaking
13.3 Community-Building

PART 3: CONTEMPORARY DESIGN APPLICATION

Chapter 14: Professional Practice
14.1 Levels of Decision-Making
14.2 Interrelationships of Planning and Design Professions
14.3 Planning and Design Methods
14.4 Current modes of Practice
14.5 Recent Landscape Design Paradigms
14.6 Land Development and Land Management
14.7 Professional Ethics / Responsibilities
14.8 Project Types
14.9 Digital Applications in Landscape Design

Chapter 15: Site Design as Problem-Solving
15.1 Commonality of Design Processes
15.2 Design Processes and Landscape Architecture

PART 4: THE FUTURE

Chapter 16: An Ecology of Design
16.1 Brief History of People / Natural Systems Relationships
16.2 Turning Point
16.3 Global Need for an Ecology of Design
16.4 Reconnecting People to Systems
16.5 Tenets of an Ecology of Design
16.6 Current State
16.7 An Integrative Model
16.8 Planning and Design for a Just World
16.9 Ecological Design Profession

Chapter 17: Landscape Design Education
17.1 Education Paradigm
17.2. Landscape Design Education
17.3 University-based Education
17.4 K-12 Education
17.5 Land Design Centres, Institutes, and Labs
17.6 Regenerative Design for a Positive Future.

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